# A TRAINING MANUAL IN ENVIRONMENTAL EDUCATION FOR PRIMARY TEACHER TRAINING

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C O N T E N T S

# PREFACE

Teacher education plays an important role in translating an intended curriculum into an effective curriculum transaction programme in the classroom. Any innovation introduced in the curriculum therefore, must accompany materials for teacher education. For effective implementation of Environmental Education in primary schools it is imperative that the teachers are well versed with the objectives, concepts, strategies and evaluation procedures so that they are able to effectively organize learning experiences. These were some of the considerations for developing this training mannual.

Under the UNESCO-UNEP International Environmental Education Programme, a large number of documents on different aspects of Environmental Education have been developed under the Environmental Education Series. These documents contain a wealth of information on various aspects/facets of Environmental Education including modules for the pre-service and in-service education of teachers and supervisors of primary schools.

In this training manual attempts have been made to present the concepts, objectives and methodology for

incorporating components of Environmental Education in the primary school curriculum. Chapter 1 contains a brief survey of the history and philosophy of Environmental Education so that teachers become aware of the global perspective. Chapter 2 explains the need for including Environmental Education concepts and issues in the primary school curriculum with special emphasis on psychological, sociological and pedagogical concerns. It further traces the history of incorporation of environmental components in the primary school curriculum from 1960 to date, highlighting the changes made in the curriculum over this period. Chapter 3 relates to the need of pre-service and in-service education of teachers. It also contains some environmental issues and concerns; including participatory actions that the teacher must imbibe himself/her self in order to effectively impart Environmental Education concerns to the pupils. Further it contains simple messages regarding conservation of resources and protection and preservation of the environment both for teachers and pupils. A schedule of a ten-day orientation course for In-service education of teachers is included as a sample in this. Chapter 4 discusses the curriculum organisation for

incorporation of Environmental Education in the existing primary school curriculum. Various approaches to curriculum organisation have also been discussed in this chapter. Chapter 5 contains the methodology of Environmental Education along with some practical suggestions for the teachers on how to analyse the potentialities of the environment. The chapter also contains a section on some useful teaching strategies such as, story telling, games, puzzles, use of over-head projector and use of magazines and newspapers in transacting activities related to Environmental Education. Chapter 6 contains some useful hints for organising group activities for transaction and evaluation along with an examplar theme/topic.

Chapter 7 deals with the evaluation of pupils' achievement. A few sample tools and techniques for evaluation are presented as reference.

The draft of training manual was prepared by Mrs. Shukla Bhattacharya, Reader, Department of Pre-school and Elementary Education, and subsequently reviewed by an expert group of teacher educators and practising classroom teachers in a working group meeting. The author is highly indebted to these participants for their valuable contribution in making the manual useful and practical.

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# CHAPTER - 1

## HISTORY AND PHILOSOPHY OF ENVIRONMENTAL EDUCATION

With the rise of industrialization and vast technological development, coupled with an exponential growth in population, the twentieth century world is facing a menacing threat which seeks to annihilate the very existence of mankind. Today we are poised at the threshold level of over-exploitation of nature and its resources. Therefore, it is justifiable that concern for protection and preservation of this planet has been voiced all over the world.

Concern for environmental protection and preservation is not new. Environmental Education has been an area of concern in the West. However, the first ever concerted effort to focus global attention to this major problem and to come out with remedial and preventive action, began with First Conference on Human Environment organised under the patronage of the United Nations from June 5-16, 1972 at Stockholm, Sweden. The Conference emphasised that environmental problems are not confined to developed industrial nations only, but in fact, encompass the whole world crossing all national frontiers. Though the need for Environmental Education had been raised earlier and attempts were made since 1960 to include this concept

at various levels of education in most developed countries, yet it was as a recommendation (96) of the Stockholm Conference that environmental education found a much surer footing with international support. This Conference recommended development of Environmental Education as a powerful tool for fighting the world wide environmental crisis. The recommendation (96) of the Stockholm Conference states ..... "The the Secretary - General, the Organizations of United Nations System, especially UNESCO and other international agencies concerned, should, after consultation and agreement, take necessary steps to establish an International Programme of Environmental Education, interdisciplinary in approach, in-school and out-of-school, encompassing all levels of education and directed towards the general public, in particular, the ordinary citizen living in rural and urban areas, youth and adult alike, with a view to educating him as to the simple steps he might take, within his means, to manage and control his environment".[1]

## INTERNATIONAL ENVIRONMENTAL EDUCATION PROGRAMME

In response to the above recommendation, the UNESCO and the United Nations Environment Programme (UNEP)

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1. United Nations, Recommendation for Action, UN Conference on the Human Environment, New York, U.N. 1972.

launched the International Environmental Education Programme (IEEP) in 1975. The Programme was designed to initiate action in this area through international cooperation. The major long-term goals of this programme were:

- To collect and systematize information about various agencies/institutions and individuals who are active in the field of Environmental Education and to circulate this information to the Member States.
- To facilitate coordination, planning and programming of activities essential to development of an International Education Programme pertaining to Environmental Education.
- To coordinate research studies involved in better understanding of phenomena involved in teaching and learning activities related to environmental education;
- To develop new curriculum methods and materials related to environmental education both in-school, and out-of-school contexts;
- To generate evaluation procedures for these.
- To provide training and retraining of personnel to adequately staff environmental education programmes; and

- To provide advisory service to the Member States.

The information collected in IEEP was reviewed in an International Workshop on Environmental Education, at Belgrade, from October 13-22, 1975. The main remit of the workshop was to discuss trends and emerging issues related to the Environmental Education scenario in different Member countries in order to formulate preliminary guidelines as also to make recommendation for further development of Environmental Education. The deliberation of the workshop came out in the form of a document- The Belgrade Charter. The charter identified the major goals and general objectives of environmental education. It emphasised that through environmental education the focus should be "to develop a world population that is aware of and concerned about, the environment and its associated problems and in which knowledge, skills, attitudes, motivation and commitment to work, individually and collectively towards the solution of current problems and prevention of new ones"[2].

The Belgrade Charter further emphasised the need to suit the educational programme in the context of new, universal socio economic goals. This new socio-

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2. The Belgrade Charter, A global Framework for Environmental Education, The International Workshop on Environmental Education (Belgrade, Yugoslavia 13-22 Oct, 1975) Final Report UNESCO, PARIS, 1975. (Doc. ED-76/WS/95).

economic order has been very well spelt out in the United Nations Strategy of International Development. This International Development Strategy Document was launched to make the International Development Decade (1970-80) a success. One of the important strategies emphasised in this document was to bring about qualitative improvement in the life style of people at large by reallocation of the resources to meet the human needs, by providing welfare measures such as roads, electricity, rural housing, health, sanitation and the provision of universal access to elementary education. The major rationale for adopting this new international strategy, was the realization that technological progress alone cannot bring about the desired improvement in the quality of life of people at large. The new concept of development took into account the satisfaction of needs and wants of every citizen of the world by fostering a balance and harmony between humanity and environment. This strategy was aimed at mitigating the basic causes of poverty, hunger, illiteracy, pollution, over-exploitation, underemployment and domination. In order that such a change can be brought about, it was felt necessary that millions of individuals must be able to adjust to the right kind of priority for themselves and adjust their behaviour patterns to commensurate with the improvement of the quality of

the environment and their fellow human beings.

The underlying current which pervades this new world economic order is to regard all the resources of the planet for the common goods of all and take into consideration it's balanced and judicious use without upsetting the balance of nature. Therefore, this calls for, "environmentally literate" citizens, who could be care takers and who would emerge, spearheading to undertake such laudable responsibilities.

From the above, it is clear that to achieve this new world economic order, it would perforce require revamping of the educational process and systems. There is a need to develop a desirable relationship between the teacher and the taught, between the school and the communities and ultimately the bond between educational system and the society at large.

As a sequel to the Belgrade Charter, a large number of regional meetings were held in various parts of the world, at Brazzaville for Africa, at Bangkok for Asia, at Kuwait for the Arab States, at Bogota for America and the Carribean and at Helsinki for Europe. Each of these Regional Meetings examined the environmental problems peculiar to their region and

made recommendations which were suited to the physical, socio-economic and cultural dimension of each country in the region. The outcome of these meetings were documented and these, along with major recommendations, served as resource materials for the Inter-Governmental Conference of Environmental Education held at Tbilisi, Georgia, USSR, from October 14-16, 1977. This conference was organised under the auspices of the UNESCO in cooperation with the United Nations Environmental Programme (UNEP). The conference was attended by 66 Member States. The conference was a significant step towards the development of difinite statements of environmental education. The conference spelt out in detail what the Environmental Education should be at various stages of education. The first part of the recommendation of the conference constitutes the criteria for development of Environmental Education. These are:

1) Whereas it is a fact that biological and physical features constitute the natural basis of the human environment, its ethical, social, cultural and economic dimensions also play their part in determining the lines of approach and the instruments whereby people may understand and make better use of natural resources in satisfying their needs.

2) Environmental education is the result of the reorientation and dovetailing of different disciplines and educational experiences which facilitate an integrated perception of the problems of the environment, enabling more rational action, capable of meeting social needs, to be taken.

3) A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment.

4) A further basic aim of environmental education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions and actions by the different countries can have international repercussions. The Environment should, in this regard, help to develop a sense of responsibility and

solidarity among countries and regions as the foundation for a new international order which will guarantee the conservation and improvement of the environment.

5) Special attention should be paid to the understanding of the complex relations between socio-economic development and the improvement of the environment.

6) For this purpose, Environmental Education should provide the necessary knowledge for interpretation of the complex phenomena that shapes the environment, encourages those ethical, economic and aesthetic values which, constituting the basis of self-discipline, will further the development of conduct compatible with the preservation and improvement of the environment; it should also provide a wide range of practical skills required in the devising and application of effective solutions to environmental problems.

7) To carry out these tasks, Environmental Education should bring about a closer link between educational processes and real life, building its activities around the environmental problems that are faced by

particular communities and focussing analysis on these by means of an interdisciplinary, comprehensive approach with will permit a proper understanding of environmental problems.[3]

The Inter Governmental Conference on Environmental Education also identified the goals, objectives, and guiding principles of environmental education:

Goals :

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to acquire knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- to create new patterns of behaviour of individuals, groups and societies as a whole towards the environment.

The objectives that follows from the aims/goals stated above, can be categorised into the following broad groups:

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3. UNITED NATIONS and UNEP, Inter Governmental Conference on Environmental Education final report. Paris, UNESCO April 1978 P. 25 (DOC. UNESCO ED/WS/48).

- **Awareness:** To develop an awareness of and sensitivity to, the total environment and its associated problems among individuals and social groups;

- **Knowledge :** To develop in the individuals and social groups knowledge/content, related to environmental problems and issues and also to help them acquire information on how to handle these;

- **Skill :** To develop skills for identifying and solving environmental problems;

- **Values and attitudes :** To develop a set of feelings of concern for the environment its improvement and protection/preservation;

- **Participation :** To provide opportunities to individuals and groups to be actively involved at all levels in working towards resolving of environmental problems and motivate them to take community action in this regard.

Some of the guiding principles of Environmental Education enlisted in the document are as follows:

Environmental Education should :

- consider the environment in its totality - natural and built, technological and social

(economic, political, technological, cultural-historical, moral, aesthetic);

- be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;

- be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;

- examine major environmental issues from local, national, regional and international points of view, so that students receive insights into environmental conditions in other geographical areas;

- focus on current and potential environmental situations, while taking into account the historical perspective;

- promote the value and necessity of local, national and international cooperation in the prevention and solution of environmental problems;

- explicitly consider environmental aspects in plans for development and growth;

- enable learners to have a role in planning their learning experiences and providing an opportunity for making decisions and accepting their consequences;

- relate environmental sensitivity, knowledge, problem solving skills and values to every age, but with special emphasis on environmental sensitivity to the learner's own community in his/her early years;

- help learners discover the symptoms and real causes of environmental problems;

- emphasize the complexity of environmental problem and thus the need to develop critical thinking and problems solving skills;

- utilize diverse earning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first - hand experiences.[4]

The objectives and guiding principles of environmental education discussed above necessitates that for imparting environmental education the

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4. ibid., PP. 25-26.

teachers should have essential knowledge component, which act as a foundation for building skills and for developing attitudes, feelings and concern for environmental protection which is the main focus of Environmental Education. A large number of educational material concerning major Environmental problems issues as well as methodology for incorporating environmental education into educational practices have been developed under the IEEP. This training manual though meant for teacher education yet focusses attention on practical ways in which environmental education can be imparted in primary schools.

# CHAPTER - 2

## THE NEED FOR ENVIRONMENTAL EDUCATION AT PRIMARY LEVEL

We all learn through the interaction of our senses with the environment and particularly so, do our children. Most of such learning is incidental and informal. But what is learnt in an unstructured manner can be made to be meaningful, if we are made aware of the various forces and phenomena operating in the environment. Experiences gained by children either in school or at home, can, therefore, be structured to enable them :

a) to develop the skills of observation and exploration of the environment;
b) to discuss with others about their own experiences, and if possible;
c) to make decisions about their day to day problem;

India is no exception to the global phenomenon of environmental degradation. It shares with the poorer seventy percent of the world, the painful results of the deterioration of its natural resources. It also suffers from the cruel dilemma of trying to halt this degradation one hand and keeping up with the pace of

development on the other. It is in this context that sustainable development is emphasised in our perspective planning. At the international level, the report of the 'World Commission on Environment and Development' also emphasised, that social and economic development must rest on the base of sustainability. Sustainable development is defined in this report as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs"[1]. Environmentally sound and sustainable development therefore, is important for survival of children. For a 'common future and for a common good' it is necessary that we educate our children who would be decision makers of the 21st century, with awareness, knowledge, skills, attitudes, values and concern towards a "more restrained, and conservationist consumption pattern and promote a long term perspective for developmental planning"[2]. This is necessary for the survival, protection and development of our children. A number of major environmental problems such as degradation of land, air, water and other natural resources, deforestation, global warming, ozone depletion, pollution of air, water and land are much talked about and the attention of the whole world is

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1. UNICEF - Children and Environment -A UNICEF Strategy for Sustainable Development - New York, 1989. P. 9.
2. ibid.

directed to find solution to these. Side by side with these environmental problems is a more serious and silent killer which is, the environment marked by non-availability of safe drinking water, lack of proper nutrition, incidence of crippling and killing diseses such as diarrhoea, malaria, measles, polio, tetanus and many other diseases. It is a well known fact that insanitation, susceptibility to infection, resultant malnutrition and repeated infection and further aggravation of already low nutritional status of children are major causes of child mortality and morbidity in this country. Our Infant Mortality Rate (IMR) is 96 per thousand live births (urban and rural combined-1986), whereas the goal for the year 2000 AD is 60 per thousand live births. Whatever meagre resources we have in terms of medical facilities are spent on preventive, rather than curative measures. Through proper planning of education to develop in the children, sound knowledge, understanding, skills and attitudes towards health and environmental sanitation, it is possible to change this dismal picture. Most of these diseases are avoidable and require low cost strategies in terms of awareness, motivation and participatory action.

It will be easier to develop right attitudes among

children, since the primary stage is the most impressionable age for learning and habit formations. Attitudes and commitments to such situations are copied or followed by children by watching the actions of teachers. We can, therefore, say that imparting environmental education to primary school children assumes great significance, in such a context.

## Historical Perspective

Traditionally, school curriculum had been overloaded with facts and information quite unrelated to the needs of the children and by and large relevance of what one learnt in the classroom was limited to rote memory. Acquisition of knowledge was given maximum priority.

With the movement of curriculum reform in the 60:s it was realised that child-centred approach to learning makes learning effective, relevant and permanent. Some of the curriculum projects which emphasised activity approach to learning, used subject structure as a base for providing meaningful activity. It was argued that if the structure of the discipline is organised into a meaningful order, it

will facilitate teaching by high-lighting some unified theme. The main emphasis in such curriculum framing, was to prepare the learner for higher education but unfortunately, this approach did not prepare the child for his life needs. School and social life remained separate entities and drifted apart further as the formal education progressed.

But in more recent years, research in curriculum development has increasingly made educationists aware of the need for reforming the curriculum by giving due weightage to the psychological and emotional needs of children. Therefore, there is a shift in emphasis from rote learning to the development of understanding ,skills and attitudes. This will enable the individual child to have a more rewarding personal life and will enable him to live as a responsible and productive member of the society.

Some of the arguments placed above, have led educationists to advocate environmental education as an approach to the curriculum organization and transaction for the primary stage of education in particular. Apart from the factors mentioned above, some of the important considerations for including environmental education as an integral part of the curriculum, are the following:

Psychological Concern

Children do not view their world in separate compartments of subject disciplines. The structure of the discipline may be meaningful and sequential, but it tends to forget or at least give less importance to the interests, abilities and emotional needs of the child for whom it is framed. A well organized curriculum based on the structure of the discipline may prepare the learner for higher education in the particular subject discipline but by and large fails to educate him for life.

Children learn better when they are actively involved in the activities which interest them. Activities based on real life situations and problems have more meaning to the children than those specially based on contrived situations. Children like to play and exploration but have less attention span and perseverance to carry out activities which spread over a long time. It is therefore, necessary that a variety of activities be organized to keep their interest.

Various researches in learning theories, especially the work of Jean Piaget and his colleagues on the

mental growth of the children have successfully proved the importance of activities which have a child-centred approach. Since children at the primary stage are by and large at the concrete operational level, such child-centered activities must be included in the curriculum. The environmental problems closer to his/her personal life are thus more important as starting points compared to more abstract and remote problems. Piagets' model on children's intellectual development is often taken as a framework for stages upon which teaching strategies are based.

## Sociological Concern

The community where a child is born, is his basic root. The culture of the community where a child grows is his heritage and he must feel that there are certain features of it which need to be preserved, cherished and transmitted to the future generation. Unless he is able to develop a sense of belonging to his immediate environment, it may be difficult for him to identify himself with the society at large, with the country and with the world itself. This sense of belonging can only be achieved when the children are actively involved with real life

problems in their environment which have personal and social relevance. For taking committed actions in solving environmental problems and to be involved in decision making process a child should be able to transfer knowledge, skills and attitudes.

A number of changes in our physical and social environment are clearly perceivable and these changes are affecting the life of the people to a large extent. Though the impact of mass media in India is not as profound as in the developed countries of the West, nevertheless the child in the primary school today, particularly in the urban areas is exposed to a vast array of information through advertisements. In future, he/she shall have to cope with a mass of data presented in many forms through posters, radio, television, cinema and newspapers, video and audio cassettes etc, which he/she will have to interpret for making decisions for himself and for the community and society in which he will be living. In order to effectively use this vast amount of information it is essential that a child from the very beginning develops skills of collecting, using and processing information.

Apart from the fact that a child must be aware of his

immediate environment as it exists today, he must also develop skills and abilities to adjust to the environment he is likely to face in the future.

## Pedagogical Concern

The psychological and sociological concerns discussed above implies that teaching strategies should reflect these. These provide guidelines and generalization which a teacher can adopt to suit his/her instructional strategies in order to achieve the objectives of Environmental Education.
Education based on environment therefore should have the following characteristics;

1. It should be basically, a child-centred approach where children are actively involved with activities relevant to their interest, age aptitudes and abilities.
2. It should encompass learning about happenings and occurrences, in the immediate environment. It should also be education through the environment i.e. using the occurrences, objects and phenomena in the environment for developing competencies/skills of gathering information useful for the learner. This knowledge and

understanding in turn, will develop in the learner, certain values and attitudes for maintaining and preserving the environement which will also educate him for improving his immediate environment. He will learn to live effectively and cooperatively in the society.

3. It should be an approach that enhances the natural curiosity of the child and encourages him to ask questions and seek answers to all the problems and events happening in his life.

   This ultimately enables the child to develop respect for logical thinking, making decisions and taking active participation in solving environmental problems in a limited way. A few samples of activities that children can doare given in Chapter 5 & 6.

**Place of EE in Primary School-Curriculum in India:**

India had a long tradition of using the surroundings as a basis for learning. In the ancient times, teachers imparted education to their disciples amidst the grandeur and beauty of nature. The life of man was at harmony with nature. The Vedas and other ancient scriptures abound in many 'slokas'- singing

hymns in praise of nature, her bounty and blessings and also the need for man to keep this balance and harmony in nature. The ancient people perceived the whole cycle of nature and the five elements i.e. land, air, water, fire and ether as life sustaining elements. The man was not regarded as exploiter of this bounty but as a component of this whole cycle of nature. Need to conserve these by judicious use was the cardinal principle enshrined in preaching of ancient vedic literature. These fundamentals/teaching somehow got lost and got eroded to a great extent with the passage of time.

The movement of Basic Education as propounded by Mahatama Gandhi can be regarded as one of the fundamental steps taken in the history of modern education in India to relate education to life, needs and aspirations of people. The two principles of Basic Education are :

- Correlating the curriculum with the productive activities and with the social and physical environment of the child;
- Intimate contact between the school and the community.

These principles of Basic Education were incorporated in the Report of the Education

Commission (1964-66) popularly known as Kothari Commission. Some of the elements of environmental education are seen in the recommendation of the Education Commission. The Commission recommended;

"The aims of teaching science in the primary school should be to develop proper understanding of the main facts, concepts, principles and processes in the physical and biological environment. In the lower primary classes, the focus should be on the child's environment - social, physical and biological..... The child may also be introduced to the plants and animals in his surroundings, the air he breathes the water he drinks, the earth he lives on...."[3]

In a Policy Resolution adopted by the Government of India in 1968, the main recommendations of the Education Commission were accepted. As a follow-up, a new curriculum framework entitled 'The Curriculum for the Ten-year School - A Framework (NCERT - 1975)' was prepared.

The objectives of primary stage laid down in the curriculum framework which are relevant for EE are:

"....The child should learn the method of inquiry in science and should begin to appreciate science and

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3. Ministry of Education, Education and National Development: Report of the Education Commission - 1964-66 (Vol. 2, School Education), NCERT, New Delhi 1971

technology in the life and world around it....

- The child should learn to cooperate with others and appreciate the usefulness of working together for the common good----- understand his role as an individual in the home, the school and the neighbourhood." 4

But prior to the publication of the national curriculum framework, National Council of Educational Research and Training (NCERT) have been engaged in a number of curriculum reform projects. One such significant project was the Science Education Project (SEP) taken up in the late 60s to renew the science curriculum at the primary stage. In this project, the science concepts were drawn from the immediate environment of the children. Though the organization of the curriculum was based on the structure of the discipline yet the concepts were derived from the immediate environment of the child. The instructional materials, textbooks and teachers' guides were based on the day-to-day problems and environmental situations. The main focus of learning was learning about the immediate environment of the child in order to understand science processes, principles and phenomena occurring in the immediate

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4. NCERT. The Curriculum for Ten year School - A Frame work, NCERT, New Delhi, 1975. P .

environment. The units in the textbooks contained topics such as Air, Water, Weather, Soil erosion, effects of deforestation, Environment and Man etc. These textbooks were activity based and fairly child-centred in approach. They emphasised development of science processes.

'The Curriculum for Ten year School - A Frame-work' mentioned before recommended inclusion of Environmental Studies as one of the curricular areas at the primary stage, as integrated course in classes I & II and in classes III - V as separate branches-Environmental studies 1 (Social Studies) and Environmental Studies II (Sc). The elements of environmental education concepts included in the curriculum emphasized learning about the environment and learning through the environment and to some extent the concepts activities included in the Environmental Studies (SC) textbooks lended to foster development of attitudes, values and participatory actions essential for - learning for the environment.

In 1986 National Policy on Education (NPE-1986) was adopted by the Government of India. The policy made profound recommendations in respect of environmental education. It stated "There is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of society,

beginning with child..... This aspect will be integrated in the entire educational process".[5]

The policy further resolved that protection of environment should be one of the ten common core components to be included in the national curriculum framework. It also recommended that a "Minimum levels of learning be identified for each stage of education".

As a follow-up of this policy resolution 'National Curriculum for Elementary and Secondary Education - A Framework' (NCERT - 1988) was developed. This curriculum framework reiterated the recommendation of the earlier curriculum framework (NCERT 1975) to include Environmental Studies at the primary stage. However is was more explicit and explained in greater detail the what and how of curricular transaction. It states "------- the child should be encouraged to systematically observe and explore things and occurences in his/her environment, formulate precise questions related to these, record, classify the observation systematically, collect information based on concrete experiences and analyse it and draw conclusion including those related to cause and effect relationship ....."[6] It further stated that the children may help to develop values and attitudes such as objectivity, openmindedness, precision,

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5. Ministry of Human Resource Development (MHRD), National Policy on Education-1986, MHRD, GOI, New Delhi. P. 26

6. NCERT, Curriculum for Elementary and Secondary Education - A Frame work, NCERT, New Delhi 1988. P.25-26

perseverence and concern for maintenance and improvement of the environment. Thus it can be seen that all the objectives of environmental education discussed earlier found its place in these recommendations.

Based on this framework, detailed curriculum and instructional materials were developed which reflected these recommendations. Minimum Levels of Learning (MLL) was developed for the primary stage. It consisted of subject-wise Minimum Learning Outcomes (MLOs) stated in behavioural terms and suggested content/activities in areas of languages; Mathematics; Environmental studies; Work experience; Art Education; and Health and Physical Education. In each of these areas content/activities related to common core componentents are also identified. The instructional materials were developed based on these guidelines. Some themes/topics related to environmental problems and issues in the Environmental Studies (SC) curriculum and text books are:

- Living things
- Plants and animals around us
- Animals their way of life
- How animals adapt themselves
- Care and protection of plants and animals (National Parks and sanctuary, Wild-life

Protection).

- Materials-their properties
- Energy, its sources and conservation of sources unconventional energy.
- Water - wonderful liquid - water pollution - Safewater.
- Soil erosion - conservation of soil and crops
- Weather - its influence on life*
- Seasons
- Food sanitation
- Sanitation and disease
- Community sanitation - disposal of waste water, solid waste, garbage disposal, reuse and recycling.
- Air - its uses and pollution
- Man, Science and Environment.

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For details please see, Bhattacharya Shukla, and others, Exploring Environment Book 1 - III (Text Books for classes III-V, NCERT, New Delhi 1987-89.

# CHAPTER - 3

## PRE SERVICE AND IN-SERVICE TRAINING OF TEACHER

The fore going discussions on need of Environmental Education have clearly shown that in the modern world the knowledge about the various aspects of the environment, its problems and issues are essential. To translate the goals and objectives into achievable reality, it is necessary that education system should play a pivotal role at all levels.

In this context education of the teachers,both at the pre-service and In-service Level, are of paramount importance. The teacher education courses should be designed in such a way as to enable the teachers to infuse the concerns of Environmental Education - in the teaching learning process.

It is necessary to re-emphasize that unless the teachers have sufficient knowledge, desired academic background and proper orientation to the concerns and issues related to Environmental education ,they will not be successful in giving environmental focus to their teaching.

In Inter-Governmental Conference on Environmental

Education held at Tbilisi, emphasized this urgent need. Recommendation 17 of the above Conference states

- "that environmental science and environmental education be included in curricula for Pre-service Teacher Education;
- that the staff of teachers education institution be assisted in this respect and teacher should get proper environmental training relating to area, either urban or rural, where they are going to work"[1]

The conference further recommended that the In-service Training of Teachers should include practical training in environmental education which should be provided in close cooperation with the professional organisation of teachers, both at the international and national levels.

The conference further recommended that UNESCO should promote dissemination of ideas, programmes and instructional materials relevant to the promotion of in-service training in environmental education. It urged the Members State to develop low cost teaching aids and materials and also make fullest use of existing materials and assess their relevance for

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1. UNESCO - Final Report, Inter-Governmental Conference and Environmental Education, UNESCO, Paris, 1978. (Pages 35 - 36).

environmental education.

The import of the above recommendation, in respect of the Pre-service and In-service education of teachers of primary schools assumes great significance. The greatest bottle-neck in imparting environmental education at the primary level is the inadequacy of trained teachers and teacher educators.

Though environmental education in some form or other has been in the school curricula for more than a decade, the same reflections and concern have not been there in the curriculum for pre-service teacher education in India.

**Pre-service Teacher Education:**

Analysis of Pre-service teacher education curriculum revealed that under science content-cum-methodology course, there is sufficient scope for infusing the relevant knowledge, skills, attitudes and values relating to environmental education. (A sample of Elementary Teacher Education Curriculum for Sikkim in areas of Science and Social studies is appended for reference). In India, different states follow different curricula for pre-service education of elementary teachers. A broad guidlines for pre-

service teacher educaion have been provided recently by National Council for Teacher Education (NCTE) in a document entitled 'Elementary Teacher Education Curriculum - Guidelines and Syllabi'. (NCERT 1991). The document provides general guidelines for developing curriculum methods and materials for the States to adopt or adapt. In the introduction to Environmental studies (Sc) the document states, "The fabric of Environmental studies by its very nature is a network of interactive linkages and accordingly the human being and his/her social and natural environment have to be viewed at such levels of generalities and specificities as may be within the range of visualization of the learner and productively operable for the furtherance of his learning. Since EVS is a subject of study at the primary stage only, the task may have to be viewed without being burdened by disciplinary considerations".[2]

However, no overt attempt has been made to incorporate the EE awareness, knowledge, skills and attitudes in the pre-service teacher education curriculum in the content-cum-methodology course in Environmental Studies. The document has suggested a number of approaches for organizing Environmental

2. NCERT. Elementary Teacher Education Curriculum - Guidelines and Syllabi, NCERT, New Delhi 1991. P. 59.

Studies curriculum. It may be worthwhile to consider here some of these approaches.

Some of the modalities recommended for incorporating Environmental Education in the teacher education curriculum given below.

**Inter-disciplinary model:**

In this approach environmental education is offered as a separate discipline in the teacher training programme and may be treated as any other content-cum-methodology course. The core content course could be selected, which would provide knowledge base relevant to primary school teachers in the related environmental problems, issues and concerns. While teaching this core content the approach should be activity based.

The objective should be to enrich the knowledge base of the trainee along with enhancing and sharpening the basic skills, attitudes and values related to environmental education. Since an inter-disciplinary course would cut across subject boundaries it would require expertise of various faculty members to teach this course,

Is it possible to adopt such an inter-disciplinary model? What are the constraints? The constraint are many:

- It is not possible to increase the time available for pre-service education to add this extra course.
- Competencies of teacher educators and teacher trainees/pupil teachers are not adequate.

One alternative could be to have such inter disciplinary course as foundation course compulsory for all pupil teachers at the pre-service level by reducing time allocation of other foundation courses.

**Multidisciplinary Approach**

In this approach various concepts of environmental education are integrated with already existing subject areas. For example, at the primary level subjects such as Environmental Studies, Language, Mathematics, Work Experience, Art Education and Health & Physical Education can be given environmental orientation. The teacher trainee may be urged to analyse the school curriculum from the point of view of giving them environmental orientation and be helped to design environment based curriculum.

There are many advantages to this approach as will be discussed in detail in chapter 4. However it may be desirable to combine both the approaches after having analysed the curriculum to find out their suitability. Those concepts of environmental education which cannot be integrated with the present curriculum may be given as separate unit and offered as compulsory course for teacher education programme. Whatever may be the approach to curriculum organization of teacher education programme in environmental education it will be necessary to keep the following points in focus while conducting the training programme:

- Academic background of teacher interms of knowledge, skills, attitudes, etc. related to environmental problems and issues. (pre-requisite skills).
- Identification of a core knowledge base and a set of skills, values and concerns that a teacher should have for imparting environmental education.
- Assessment of competence/skills acquired by the teacher and those expected of him as a result the training programme; and
- Knowledge of environmental issues and problems of resource management;

- Identification; investigation, evaluation of environmental problems at local level and taking participatory action for environmental protection; and
- Providing opportunities through situational analysis for value clarification, skills and knowledge of the role to human values in environmental issues.

## In-service Teacher Education

The strategies for organising the in-service training programmes in Environmental Education have to be very well planned, especially in view of the nature of such a training programme. The number of primary school teachers in India as per latest figure (1987) is 16,16,685 and the number of primary schools in the country is 5.37 lakhs. To provide in-service training of any kind to this vast number is a formidable task in terms of training management, money, and human resource. The problem of man power becomes more acute, particularly, the time factor of the teacher, as the teachers who are employed in schools cannot remain absent from duty for long period of time. Organising training programme for such a large number of teachers will require prior preparation and training of proportionately large number of teacher educators/resource persons. Therefore,

provision of sufficient money, time and resources for massive orientation of in-service teachers is essential.

Whenever, there has been a major renewal of the curriculum at the national level it has usually been the practice to organise programme for in-service teacher education. The National Policy of Education (NPE) 1986 laid special emphasis on education of in-service teachers as well as pre-service teachers. As a part of implementation of this education policy, NCERT developed 'National Curriculum for Elementary and Secondary Education - A Framework', (NCERT 1988). The Framework provided guidelines for detail curriculum development and other activities related to curriculum implementation. The Framework recommended that special training programme for science, mathematics, work experience, and health and physical education will have to be organised to help implement the new curriculum. It further recommended that NCERT should take the resonability of training of resource persons. As a follow-up of this recommendation a Programme of Massive Orientation of School Teachers (PMOST) was launched as a Centrally Sponsored Scheme with

a view of orienting the teacher educators and teachers on the thrust areas under NPE - 1986.

The NPE - 1986 also recommended that "The new programmes of teacher education will emphasise continuing education and need for teachers to meet the thrust envisaged in the policy". The policy further recommended the establishment of District Institute of Education and Training (DIET) with the capability to organise training for elementary school teachers. As a follow up of the policy implementation, a number of DIETs have been established. Thus, there is an infrastructure available in the country for the pre-service and in-service training of elementary teachers. The in-service courses proposed to be planned for environmental education should involve DIETs in the management of the training programme.

The modalities of teacher education as mentioned for pre-service education will apply to in-service courses as well. A ten day schedule for in-service education for primary teachers is given in the subsequent section.

Any programme for in-service or pre-service Environmental Education should aim to develop in the teachers a sensitivity to various aspects of

environmental concerns and issues, so that they can generate a similar sensitivity in the children they work with.

Some of these concerns are listed below:

1. To develop an appreciation and respect for the earth as a provider and sustainer of life.
2. To develop an understanding and respect for the balance in nature, as well as our role in maintaining it.
3. To understand the interdependence of living organisms within an eco system.
4. To develop an appreciation of the beauty of nature and aesthetics in every day life.
5 To develop an awareness of oneself as a part of a larger inter related system and therefore the effects of one's own actions.
6. To spread awareness of various environmental problems and their causes. To explore alternatives available and try and develop problem solving strategies, particularly, with reference to local environmental issues.

**Actions**

To actualise the above objectives inservice programmes should encourage trainees to take positive personal action such as -

1. To be selective in our consumption of natural resources.
2. Not to needlessly destroy the environment.
3. To choose or appreciate life-styles which are in harmony with the environment and which foster long-term benefits.
4. To see that personal and national wealth should not lead to waste.
5. To take those environmental decisions which would improve the quality of life regardless of social and economic status.

**Practise What you Preach**

Teachers/trainees should lead by example. Here is a list of practical conservation ideas and suggestions for a school situation.

1. Conserve paper:
   - Use paper carefully. Write on both sides of the paper.
   - Make optimum use of each sheet of paper or page avoiding excessive marigns and an unduly bold wirting format.
   - Have a black board or slate at home for rough work, revision and practice rather than using paper.
   - Utilise used paper for craft work, for making envelopes, packing etc.
   - Save envelopes from consumer goods packing, postal deliveries for reuse.
   - Reuse cartons, packing paper and gift wrappings.
   - Use a cotton cloth handkerchief rather than disposable facial tissues.
   - Do not take computer print-outs unless they are absolutely necessary and use the reverse side of waste print out paper.

II. Save Electricity:

- Do not leave lights on and fans working when not needed.
- Try replacing high wattage bulbs (incandescent lamps) with low wattage tube lights (flourescent lamps).
- Open windows, draw curtains and venetian blinds during day time and use free natural day light.
- Reduce the use of T.V. or radio to the barest minimum.
- Reduce the operating time of household appliances to the minimum possible.
- Do not overheat water in your geysers. Cooling hot water with cold water is waste. of power used to heat the water in the first place.
- Do an energy audit of how much electricity each child uses at home/school.
- Wear sweaters instead of using heaters when it is cold.

III. Conserve Water :

- Don't keep the tap running when you brush your teeth.
- Use a bucket instead of a shower for bathing.

. Don't use toilets for flushing down disposable items. They do not magically disappear. They reappear in other places and will still be part of the pollution problem.
. Have leaky taps and water pipes repaired promptly.
. Don't dump waste in rivers, streams and ponds.
. Do not use washing machines, they use up a lot more water. In a country like ours with plenty of sunshine washing and drying clothes are better done manually.

IV. Select the materials you use with care. Avoid use of nonbiodegradable materials that are used in every day life.

. Avoid the use of plastics (as far as possible).
. Buy bottled products instead of those in plastic containers.
. Use ceramic (pottery, porcelain) tableware rather than plastic varieties.
. Do not accumulate plastic bags. Carry your own cloth bags when you go shopping.
. Use ink pens rather than ball point

Ball point refills are made of plastics that becomes litter when discarded. You may use 15 to 20 ball point pens or refills every year, whereas ink pens stay with you longer, improve and maintain your handwriting and above all they are environment-friendly.

V. Other Ideas :

- Involve parents.
- Start a Nature Club
- Appoint an "Environment Monitor".
- Award a "Young Environmentalist" prize.
- Help children care for "pets".

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Source : Gandhi, Maneka, ,"What You Can Do For a Cleaner and Greener Delhi" Ministry of Environment and Forests, New Delhi, , P.

## AN OUTLINE FOR A TEN - DAY PRE-SERVICE/IN-SERVICE TRAINING PROGRAMME

| | DAY 1 | DAY 2 | DAY 3 | DAY 4 |
|---|---|---|---|---|
| Session I (1½ hrs) | Introduction What is Environmental Education? The history/ Philosophy of EE | Major Environmental Issues-An outline (Participants dvided into six groups, for in-depth study & present on Day 4 to 9) | The need for EE at Primary Level | Group present/discussion on E. Issues relating to hand =erosion, deforestation, desertification. |
| Session II (1½ hrs) | Preliminary Activities-Participants to carry out and analyse for learning outcomes. | Padagogical Approach to Environmental EDucation various models | Teaching/Learning stategies (Methodology)-stories/ games/puzzles etc. | Participants to personally try out activities given along with sample modules-small group work - analysis of activities for learning outcomes-knowledge skills and attitudes. |
| Session III (1½ hrs) | Preliminaary Activities-Participants to carry out and analyse for learning outcomes. | Preparation of webs on topics selected from curriculum-how to apply above models | Lesson plans based webs of previous day, using a variety of strategies. | Participants may try to expand list of possible activities. |
| Session IV (1½ hrs) | Defining the skills required at primary level- Basic (Communication) Study & Social Skills | Preparation time for Presentations of Day 4 -9 (3 days) | Participants continue preparation-livrary work-books, newspapers, periodicals required. | |

| DAY 5 | DAY 6 | DAY 7 | DAY 8 | DAY 9 |
|---|---|---|---|---|
| Modern Agriculture - benefits and hazards. | Group present/discussion. The energy crisis and cycles in nature. | Pollution problems- Water,air,noise | Population | Practical steps in consentration in a school situation and at a personal level. |
| | As on Day 4 & 5 | Participants to make and try out on each other.<br>1) Stories<br>2) Games<br>3) Puzzles | | Using Newspapers and Magazines - Participants to prepare teaching material based on above. |
| | As on Day 4 & 5 | Participants to make and try out on each other.<br>1) Stories<br>2) Games<br>3) Puzzles | Population | Group discussion to pinpoint practical problem. of implementation 'suggest solutions. |
| The use of audio-visual aids-Participants to prepare samples. | Classroom Management - how to plan for class work in E.E. | Evaluation in Environmental Education. | Developing some evaluation o - practical session. | Concluding session. |

# CHAPTER - 4

## PEDAGOGICAL APPROACHES TO CURRICULUM ORGANIZATION IN ENVIRONMENTAL EDUCATION

Approach to curriculum organization, depends on the inclusion of major aims and goals of a particular discipline. Having ascertained this, it is necessary to identify the broad objectives in terms of knowledge, understanding, attitudes and skills. These in turn, need to be broken down to attainable specific objectives, preferably stated in behavioural terms which can very easily be assessed by the teacher.

Often statements of instructional objectives are in very broad terms. Thus it becomes difficult for the teachers to aim their teaching/learning activities towards the attainment of these intended learning outcomes into actual (attained) learning outcomes.

The approach to organize curriculum in Environmental Education should also take into account this basic design. Thus the organization would flow directly from the objectives of Environmental Education spelled out in the Belgrade Charter. These relate to **awareness, knowledge, skills, attitudes, values, motivation,**

concerns (evaluation ability) and participation which have been elaborated in Chapter 1.

The existing primary school curriculum should be analysed with a purpose of locating the lacunae as well as plug points for infusion or integration environmental education concepts in terms of the above, wherever possible and feasible.

Considering the nature of Environmental Education, two models for incorporating Environmental Education have been suggested.

One model considers Environmental Education as an inter-disciplinary approach i.e. the concepts/contents are drawn from different disciplines such as Language, Social Science, Science, Value education etc. to form distinct modules of Environmental Education. The other approach is multi-disciplinary, i.e. it uses other disciplines existing in the curriculum and gives reorientation to these, for incorporating the knowledge, skills attitudes and concerns of environmental education. The later approach is best suited for the primary stage. One such model of multi-disciplinary organization is the Infusion model.

**The Infusion Model :**

In this model, deliberate attempts are made to give an environmental focus to an already existing discipline. Some aspects of the content are deliberately selected and specific activities are included, which give the student an understanding of problems and issues to generate a general awareness of the environment. Opportunities are provided for the students to raise questions and seek answers to their queries. The students are motivated to probe deeply into a topic under study. For example, a unit on "Forest Resources" can be given an environmental focus by relating the such resources to the problem of deforestation and their interrelationships. A number of environmental issues can be discussed as a follow-up of this study. At the primary level it is more appropriate to organise environmental education curriculum as an infusion model. It makes little demand on the already have unfortunately though a primary school teacher is curriculum load. Generalist, he/she transacts curriculum based on different subject areas. A discipline-based curriculum transaction is one which strictly follows the structure of the discipline. In order to give it an environmental dimension, appropriate concepts/themes can be

selected which can be major contributers for fulfilling the objectives of environmental education and inculcation of attitudes towards the conservation of environment.

Some of the traditional disciplines where such infusion of environmental knowledge, skills and concerns can be easily done are - Language, Art and Craft, health and Physical education, Social Studies, Natural Sciences and Work experience. Illustrative examples of how environmental related content and concerns can be infused in some of the existing curricular areas at the primary level are discussed below:

a) **Language :** Cultural and moral values embodied in our cultural heritage is passed on from one generation to another through teaching of language and literature. A variety of folk tales, folk lores, mythological stories, legends and other stories convey profound thought, feelings, aspirations and values of man, towards his fellow beings and also to the social and physical environment. Our tradition abounds in stories which have a positive bearing towards knowledge, perception and awareness of the environment.

A concern for all living organisms the aspect of interdependence of man and nature and man's oneness with the universe-all these need to be highlighted in the teaching of language for infusing an environmental dimension into it.

b) **Art and Craft :** Another cultural dimension of our heritage is immense diversity and originality in art and craft. Traditionally, man has practised art and craft by taking clues from nature. In nature, recycling of material is constantly taking place and there is hardly any wastage. This can form a wonderful example of creative expression. From time immemorial, observation of nature in its varied hues, fragrance and expression has motivated man to produce best of his creations. Through art education, the teacher can develop in the student a deep appreciation for physical beauty in nature and the importance of preserving it for posterity. He/she can also draw attention of students to discord in this harmony which has been the result of man's intervention and are out of tune with this balance. Examples of modern art/craft which make use of non-bio-

degradable materials should also be given as examples to illustrate this point.

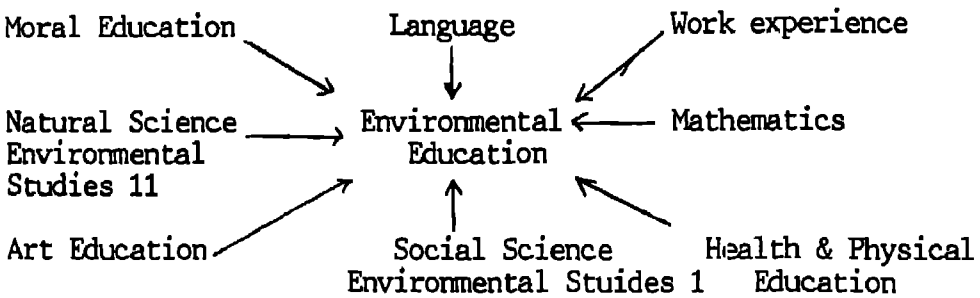


Fig. 4.1 Interdisciplinary Model

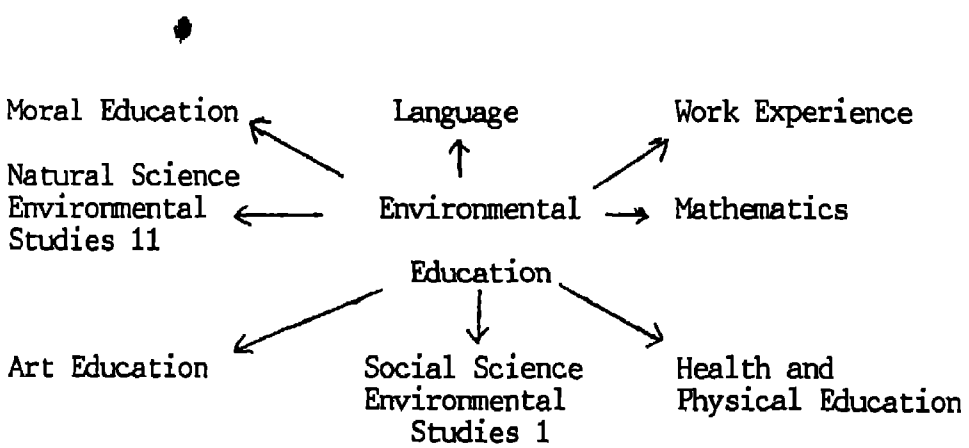


Fig. 4.1 A. Multi-disciplinary Model Infusion Model

c) **Health and Environmental Sanitation:** In the developing countries insanitation, malnutrition and poverty are perhaps the greatest of all pollutants. The vicious cycle of **insanitation,** incidence of water, food, and airborne disease which result in high mortality rate amongst children and also morbidity resulting in severe mulnutrition, thus making a child further susceptible to diseases, is a common picture. The incapacitating childhood diseases can be prevented early if proper awareness, knowledge, understanding and skills are imparted to children and through them to their parents in nutrition, health education and environmental sanitation. By building community awareness to these problems- pollution of water, air and insanitary handling of food and water can be prevented with low cost intervention programmes for school and community.[1]

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1. Bhattacharya, Shukla. For further details please see 'Nutrition, Health Education and Environmental Sanitation - An Impact Study', NCERT, New Delhi. (In Press).

The curriculum at the primary level provides enough opportunities to sensitize children to these hazards. In subsequent chapters, examples of such activities will be further elaborated upon.

Other types of curriculum organization suggested for incorporation of Environmental Education are the Applied learning model and the Holistic model.

**Applied Learning Model :**

This model uses a problem in real, life situations of the community and uses the knowledge and skills acquired from different disciplines to solve it. The steps are

- identifying the problem and its implications proposing alternative solutions
- examining each alternative solution in terms of the merits and demerits of environmental consequences
- selecting solutions which will be most conducive to environmental protection and preservation.

In a very limited way, the problem solving approach mentioned above can be used at the primary level.

Often, the environmental problems/issues in real life are so complex that they require expertise from various disciplines such as Physics, Chemistry, Biology, Agriculture, Ecology, Engineering, History, Economics, Law etc. Hence the need for meticulous preplanning and team teaching. Depending on the nature of the problem, this may also need community support and expertise. The complex environmental problems and issues cannot be taken as starting point at the primary level considering the age level and maturity of the children, expertise of teacher and other resources constraints. However, examples of simple problems which can easily be perceived by children at the primary school and for which they can find solutions by taking community action have been described in the activities included in Chapter - 6. These are but few examples. Teacher should choose problems based on real life needs and of relevance to the children.

**Holistic Model :**

The holistic model can be said to be an ideal model for understanding the total environmental interactions that take place around us - physical, natural, socio-economical, political etc. "It can

be used to study a defined physical area of any size with the ultimate aim of assessing and evaluating the ecological health of the environment Having assessed this, the corrective measure can be identified, actions planned and further implemented.[2]

The holistic model is preferable for higher stages of education and is not suitable for the primary stage.

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2. Refer to Environmental Education Module for Pre-Service Training of Teachers and Supervisors for Primary Schools, UNESCO UNEP, Environmental Education Series - 5, UNESCO, Paris, 1986. P. 89-90. (DOC UNESCO ED/86/SW/917).

# CHAPTER - 5

## METHODOLOGY OF ENVIRONMENTAL EDUCATION

The teaching learning strategies to be adopted for imparting the Environmental Education should flow from the objectives of Environmental Education mentioned in the previous chapters. It may be worthwhile here to further stress that these basic objectives should be woven into the teaching learning strategies to be adopted for imparting environmental education. These are:

- awareness of environment and its associated problems and issues
- acquisition of knowledge and understanding of such problems, issue and concerns
- acquisition of skills of exploring the environment, in order to be able to identify and anticipate problems
- identification of alternative modes for preventive and corrective measures
- adoption of certain value structure and developing concern for commited action in environmental preservation.

It can be seen from the above that these basic objectives of Environmental Education relate to three aspects of Environmental Studies mentioned in Chapter 2. These are learning **about** the environment - awareness, knowledge and understanding about the environment/ learning **through** the environment i.e. developing skills and mental processes as a result of exploring the environment; and learning **for** the environment i.e. developing alternate mode for prevention and corrective measures and internalizing value structure and concern for environmental preservation. Therefore for the practitioners of Environmental Studies these are not new. Most teachers of Environmental Studies try to inculcate in their pupils these skills and competencies.

These skills and competencies have been categorized under three headings viz. - basic skills; study skills and social skills. However, considering focus of attention on the aims and objectives of EE it is possible to group the skills into five major groups as suggested in the Environmental Education Module for Pre-service and Training of Teachers and Supervisors of Primary Schools (UNESCO - UNEP 1986).

These are:

Group A - Investigative, diagnostic, decision-making skills.

Group B - Values clarification skills.

Group C - Anticipatory - predictive skills.

Group D - Assessment - evaluation skills.

Group E - Action oriented skills.

For effective transaction of the environmental education curriculum these skills cannot be imparted in isolation, therefore, the key concepts basic to the understanding of the environment in its totality, emerging problems and issues should also be included. These concepts/content such as, environment, its abiotic, biotic, socio-cultural and other aspects; natural resources; eco-systems; energy flow in the atmosphere; energy flow in nutrient cycle;and preservation of cultural heritage etc. should form the knowledge base for the transaction of the curriculum. The teacher must have basic understanding of these concepts.

These concepts need to be broken down and simplified to the level of understanding of the primary school children and suitable activities can be organized keeping in mind the curriculum organization structure described in chapter 3. Figure 5.1 and Table 5.1 show

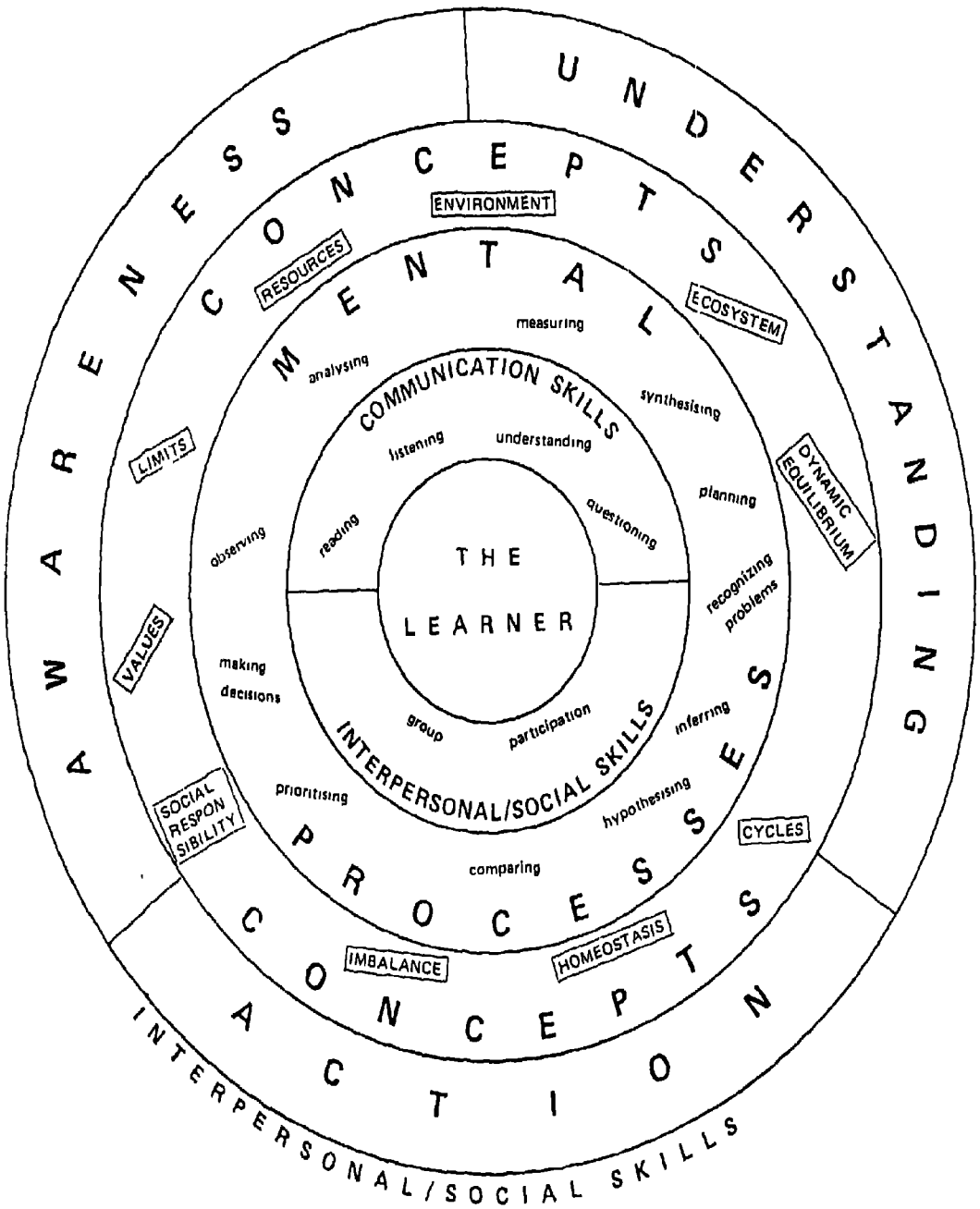



Fig. 5.1 Summary of Skills and Concepts to be stressed in Environmental Education

Source: Environmental Education Module for Preservice Training of Teacher and Supervisors, For Primary School-Environmental Education Series - 5, UNESCO-UNEP, 1986. UNESCO, Paris

Table 5.1
Groups of Mental Skills and Teaching/Learning Strategies for Acquiring Them

| | | GROUPS OF SKILLS | MENTAL PROCESSES | TEACHING/LEARNING STRATEGIES |
|---|---|---|---|---|
| AWARENESS | A | investigative<br>diagnostic<br>decision-making | observing<br>analysing<br>measuring<br>synthesising | field trips<br>experiments<br>project work<br>problem solving |
| | B | values clarification | analysing<br>prioritising<br>comparing | role-playing & simulation<br>debates<br>discussion<br>situation analysis |
| UNDERSTANDING | C | anticipatory | hypothesising<br>inferring<br>recognising signs, trends, patterns<br>analysing<br>synthesising | experiments<br>situation analysis |
| | D | assessment<br>evaluation | analysing<br>discriminating<br>application | establishing criteria<br>forming judgments |
| PARTICIPATING | E | action-oriented | planning<br>problem identification<br>evaluating<br>decision-making | project work |

**Source:** Same as on page 61.

and predictive skills of hypothesizing, inferring, analysing, synthesizing, recognizing patterns

Action-oriented project work should seek to identify problems of imbalance in the equilibrium and be aimed at correcting these. Some examples of problems of imbalance are epidemics, floods, droughts, pests, man-made disasters, e g., metal poisoning from factory waste.

Project work makes use of the talents of all in the working group. It stimulates the interest of students, tutors and community, and promotes interdisciplinarity. It is, however, time consuming, and the evaluation of students' work is difficult.

*Example 1*

Activity: Historical review of natural disasters in an area over a period of 200 years
Teaching/learning strategy: *Project*
Skill Group: A (Investigative, decision-making)
Mental processes: planning, analysing, synthesizing, prioritising, values clarification

*Objectives*
Knowledge: Students should be able to state
— the natural disasters in a prescribed area over a 200 year period
— the environmental effects of these disasters and steps taken to deal with them
Skills. Students should demonstrate an ability to
— interview citizens to obtain needed information
— use the library as a resource centre
— design a suitable disaster drill for use in a primary school in the event of e.g. a hurricane
Attitudes: Students should show
— a willingness to find out things for themselves
— an appreciation of the experiences of the elderly
— a willingness to consider alternatives
— a readiness to act in a disciplined way in a disaster
Outline of procedure: Students will
1) gather information from any source available, including the library, and the remembered experiences of the older citizens of the area on —
— the nature of the disasters
— the extent of the problems they generated
— efforts at dealing with the problems
2) assess these problem-solving efforts for practicability and usefulness
3) suggest alternatives to them, giving sound reasons for their proposals
4) design a 'disaster drill' for a primary school to be put into operation if there is a hurricane
5) support the design theoretically, that is, show how it would help to alleviate difficulties, prevent panic and save lives.

*Example 2*

Activity: investigating patterns of agricultural practices in a rural community.
Teaching/learning strategy: *Project.*
Skill group: A (Investigative, diagnostic)
Mental processes: observing, measuring, analysing, synthesising.

*Objectives*
Knowledge: Students will be able to state
— the main agricultural products in a specified area

essential that one understands these common key features of any environment. These important features are - structure, location and change. Let us take them one at a time to understand what these terms mean.

**Location :**

Location would mean the specifics of the situation such as: (1) Geographical location i.e. physical features: latitude; landscape, hilly, plane or a forest region, etc. (ii) The rural/urban features of the environment.

**Structure :**

The structure of the environment would include both biotic and abiotic. These are; (i) types of flora and fauna i.e. plants and animals available in the environment, (ii) kind of climate and weather conditions prevailing in the environment which will in turn have implications for the kinds of plants and animals available, (iii) the type of land surface, source of water, soil, major crops, agricultural practices, etc.

The structure would also include man made features such as - kinds of buildings, streets etc. and various

essential services in the locality.

**Change :**

The first two characteristics would comprise the physical features of a particular environment but environment in its totality will include not only physical features but also the social environment pertaining to a particular locality. Therefore, change in the environment during the course of time is an important aspect and is essential to study for the deeper understanding of the environment. Under the features of change the following can be included (i) Origin of the people inhabiting the locality and changes in their life style with the passage of time. (ii) Man made communication system and their resultant effects both negative and positive. (iii) Social customs and culture (language/literature, games, art, festivals etc.) (iv) Impact of science and technology, (v) Influx of different people from outside and its effect on socio-economic conditions such as, problems of over - population, shortage of essential commodities if any, Steps taken to solve these problems. Are such steps environmentally sound?

For the purpose of analysing the potentialities of the environment two important aspects have to be reckoned

with. The first important aspect is that all the features listed above are interrelated. These are a part of an interactive system, each contributing to a change in the other. Thus there exists dynamism in a state of equilibrium. For example, altitude and geographical location of a place will determine the type of climate, weather and kind of plants and animals prevalent there. Weather, climate and land surface in turn will determine the modes of transport and means of communication; the types of buildings and materials used for buildings; clothes; occupation of people and their life style. This will directly and indirectly affect the social custom, food , art and other aspects of life of the people living in the locality. These in turn will also affect environmental problems and issues.

A second very important point is the concept of **concentricity.** It is often mistaken that environmental education is only based on the study of the immediate environment and thus does not provide enough scope for understanding of the world at large. A study of the local environment can lead a child to know more about the world outside his immediate surroundings. For example, the study of local cash crop can extend to the marketing of the crop; where it

is sold, what is purchased in exchange, how does it link up with the ecnomy of the place, state and the country, how it affects the people involved in production, problems - environmental, health and occupational hazards associated with it etc.

Having discussed the potentialities of an environment let us now see how the features of the environment can be used for developing different skills and compentence related to environmental education.

The basic skills of language and Mathematics can be developed through almost all activities to be undertaken by the children for understanding their local environment. Therefore, a few of study skills can be taken up for discussing the features of an environment which can help in the development of such skills. The features given below are only hypothetical. For proper planning of an effective teaching learning strategy the individual teachers must analyse their local environment and its potentialities.

(i) Features allowing for development of experimental and classificatory skills:

(a) The various kinds of plants and animals life

in the locality, their shape, size, body feature and other characteristics; adaptation of these living things to the environment; food habits of animals and associated modifications in their body features; food chain, interdependence of animals including man and plants; result of interference of man in disturbing the ecological balance.

(b) The type of land surface, for example, mountains, hilly tracks, plains, valley, variety of rocks, soils, soil erosion-its effect etc.

(c) Source of water

(d) Range and variety of people in the locality and range of their occupation and interdependence of occupation (chain).

(e) Range and variety of essential services in the locality such as health centre, post office, police station, 'panchayat ghar', facilities for drinking water etc; how these services are utilised.

(ii) Features allowing for development of concept of change:

(a) Natives of the region and those who have migrated from outside to settle there - from where and why they have come; what type of

language and other cultural components they have brought with them; how these features have influenced the local culture, etc. Are there any socio-cultural problems as a result of these

(b) Occupation around which the community has developed. For example, the community may have been predominantly that of fishermen in the coastal areas or basically on an agricultural community or an urban settlement. The type of changes that have been brought about in the course of time in such a community due to occupation and life style, has it affected the environment adversely? If so, corrective measures can be adopted.Are these measures environmental sound?

(c) Development and resultant effects of manmade links of communication. For example, road ways, railways, bridges etc. What changes have been brought about in the locality by these developmental activities? In what way it has affected the flora, fauna and land use in the area.

(d) A range of social developmental activities

taking place in the locality, how have these developmental activities affected occupation and life style of the people. Are these developments environmentally sound?

(e) A range of buildings showing change in them, in terms of type and nature of building materials used for construction; nature of construction change in the style and designing of construction etc. through a period of time.

(iii) Features allowing for the development of of location

(a) Buildings of different types - like shop, pucca' and 'kaccha' houses, dispensary; places of worship, like temple, church etc. (These can be used for developing, measuring mapping and skills of finding location of a particular place with respect to a fixed location).

(b) Range and variety of street types, roads, waterways or other communication channels.

While finding out the different features of the environment which can be used for developing skills;the teacher has to plan interesting activities

involving active participation of the children. Some suggested activities are included in Chapter 6. Here a few interesting teaching strategies will be discussed which will make learning a joyful experience.

## SOME USEFUL TEACHING STRATEGIES FOR PRIMARY CLASSES

In order to get the key messages of Environmental Education across in a manner that will appeal to young children, it is important to use a variety of techniques that will generate interest and promote active, participative learning in the classroom. While it is true, that no "lesson" can be "taught" without the content, the fact that children must learn, understand and remember, for that the teacher must be constantly aware of the long-term goal so as to help children internalise the concepts of Environmental Education and to put the principles learnt into practice in their own lives. It is this "action" which is our real target.

Teachers of primary classes interact closely with their pupils. They know exactly what their interests are. Hence they must seek ways of communication that will catch the attention of young ones. A few examples of simple interesting teaching learning

strategies are described here. The illustrative examples are only samples. An innovative teacher can design her/his own strategies.

**1. Storytelling :**

It is an age-old art which can be effectively used in all areas of learning. It is important to find or make up small stories which can be used in a single teaching period. Here is one such sample. It is however essential that the story does not get its message across as if preaching. It is also important for the teacher to actually practise and demonstrate by personal examples, the principle that is sought to be conveyed through the story. As a follow up of the story telling session, he/she could explore through discussions, other possible solutions to the "environmental problem" that has been posed. For example in the story that follows could the students perhaps, grow a potted flowering plant in their classroom? Or could they come to a compromise and agree to have only one flower in their teacher's vase rather than a handful or a large bunch?

## The Story - Bumble and Sunny

Bumble was a little bee who lived in a corner of a garden. His body was covered with brown and yellow stripes. His wings were delicate but strong. All day long, they carried him from place to place in search of food.

Sunny was a huge, yellow sunflower growing in the same garden. Bumble and Sunny were good friends. In the daytime, when the sun shone brightly, Bumble often danced in the air just above Sunny.

"Won't you give me some of your nectar, Sunny ?" he asked.

"It's my favourite food."

"Of course, dear friend", replied Sunny. "Come and help yourself, I've plently to spare."

"Bzz...bzz...bzzzz...", sang Bumble. "I love this sweet drink. Thank you Sunny."

Sunny and Bumble spent many happy days like this.

At night, when it grew dark, Sunny would close up and go to sleep. Some times, Bumble spent the night, cosy and comfortable inside Sunny.

Every day - Ramu passed the garden on his way to school. One morning, he was earlier than usual. He noticed the giant sunflower in the garden. "Ah", thought he, "That will look good on my teacher's

table."

Quickly he ran up to Sunny. Reaching up, as high as he could, he gave a strong pull and broke the sunflower's stem.

"No, No! Don't do that to me!" shouted Sunny, in fright.

But Ramu could not hear the sunflower.

He went happily on his way to school.

When he entered his classroom, he went up to Mrs. Mathur, his teacher, with a big smile on his face.

"Ma'am, here's something special for you. I found it in a garden and brought it to school. It will look good in a vase on your table."

"Thank you, Ramu. That was nice of you", said Mrs. Mathur.

"Tomorrow we shall both visit this garden. You must show me where this beautiful sunflower grew."

The next day, Mrs. Mathur and Ramu visited the garden. They found the broken stem of the sunflower plant drooping sadly as it was drying up. Bumble was buzzing around crying, "Sunny, Sunny.... where have you gone ?"

He missed his friend badly.

Mrs. Mathur said to Ramu, "See how the little bee is searching for the sunflower. The flower used to give him nectar everyday. Now he misses his food and his

friend. We should leave flowers to grow in gardens. They look pretty there and will last longer. They give food to bees and some birds too. For our classroom vase, we will make some pretty flowers from acraps of paper and cloth."

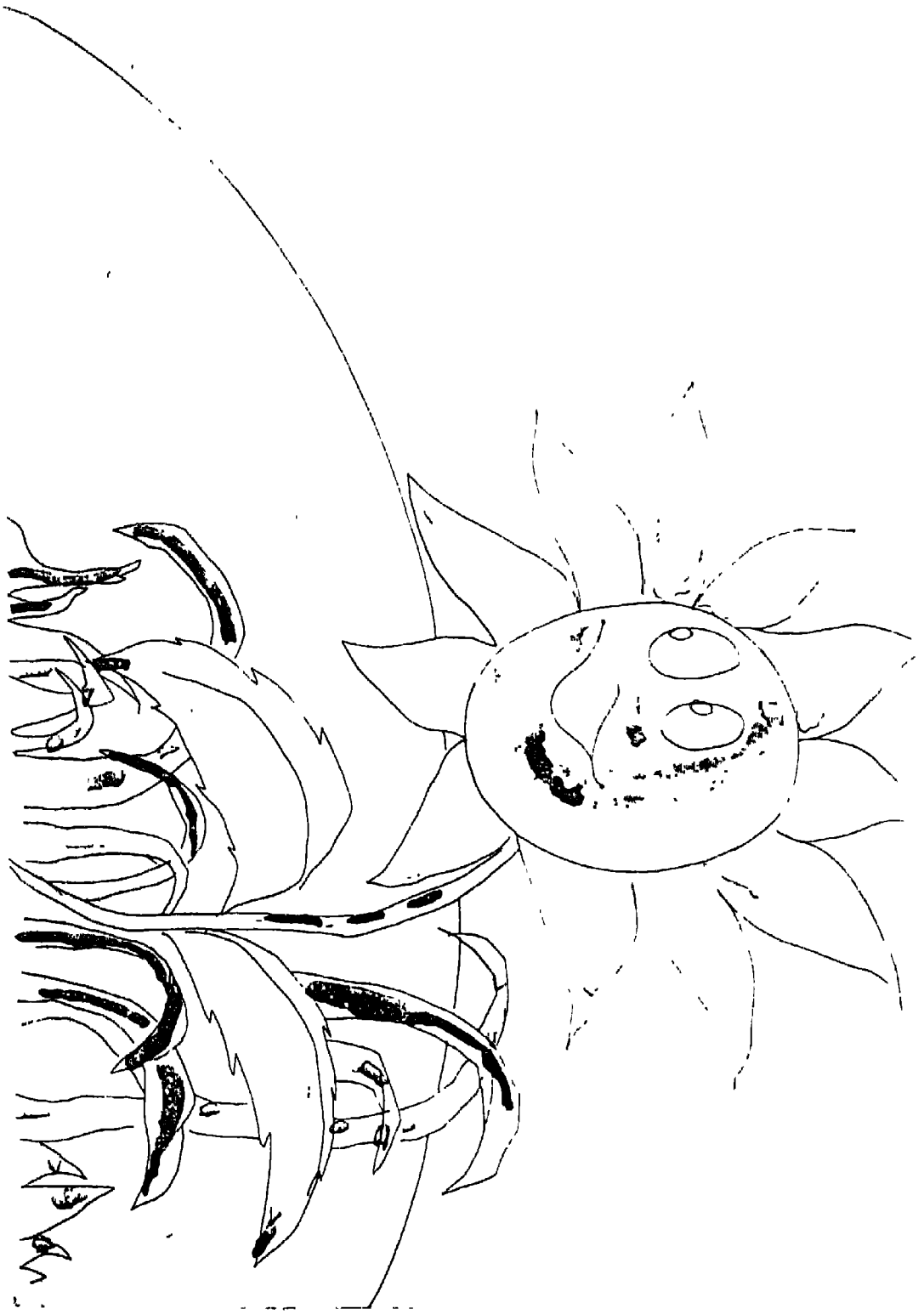
The storytelling itself can take many forms.

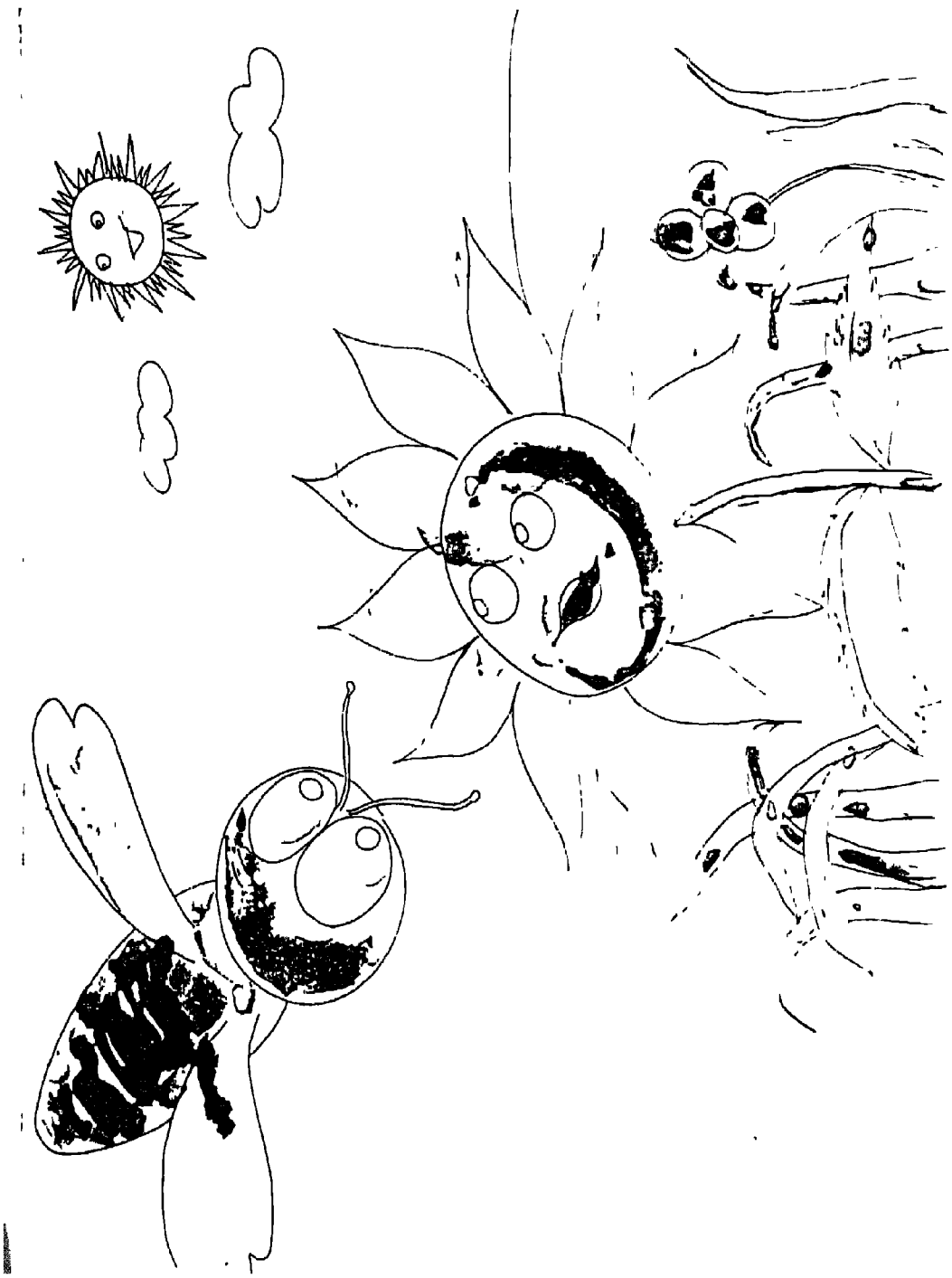
a. The tale can be told by the teacher in the classroom. If he/she sits on a low stool, slightly raised above the children, they can all watch the expressions on his/her face and the actions or movements that accompany the story.

b. The narration can be made livelier with the use of simple flash cards. As a follow-up the children could even be asked to re-tell it themselves. They will make up their own dialogues as they go along and this provides valuable language practice. It becomes a role-play as each part is taken on by one child. They might expand the story by adding a greater number or variety of characters. Role playing and dramatisation helps the children experience the "feelings" of the characters. Another way of presenting the visuals is to paint or draw them on to a long strip of cloth of paper. This is

gradually unrolled as the story proceeds.

Slightly older children might make up small action songs on their own and use these instead of spoken dialogue to tell the story. After the story-telling session, the children might be asked to arrange the flashcards in the correct sequence or draw their own set of pictures telling the story. (see Fig. 5.2 - 5.9)



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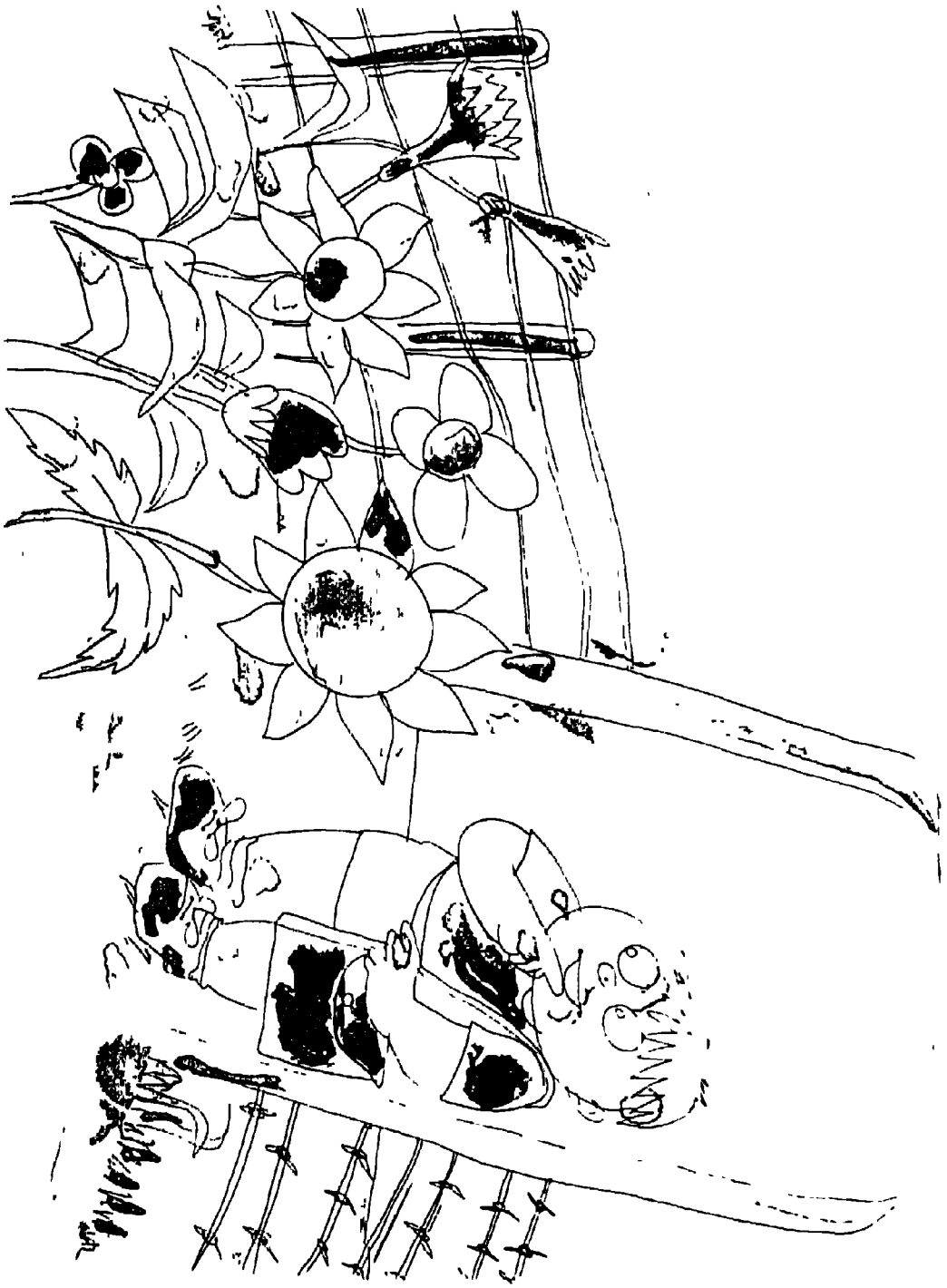
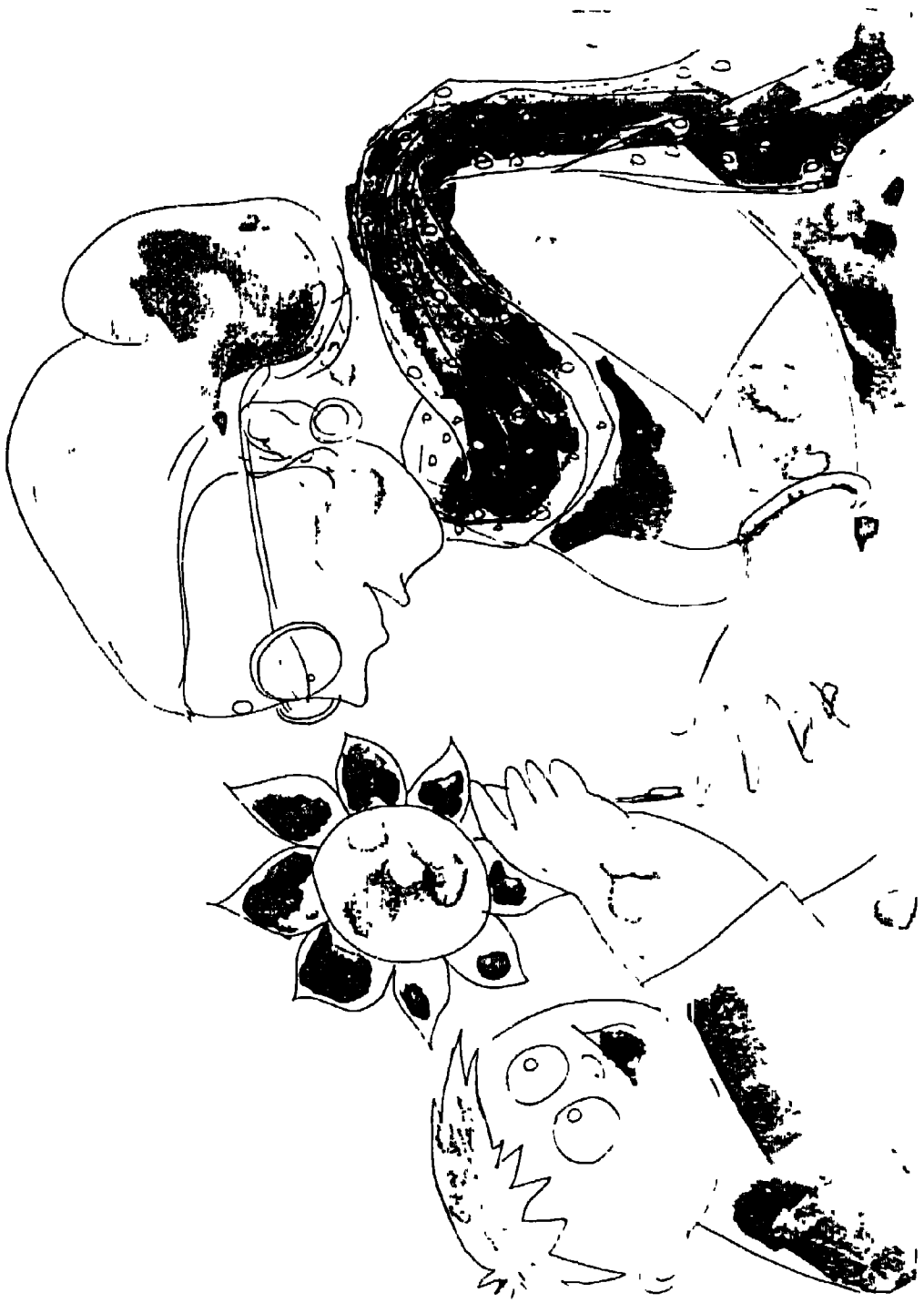




c. Puppets provide a simple way of focussing the children's attention and getting them involved in the story. Simple glove puppets can be made using old socks, as shown below. If desired the puppets may be used only to represent Bumble and Sunny, leaving the roles of Ramu and Mrs. Mathur to two children.

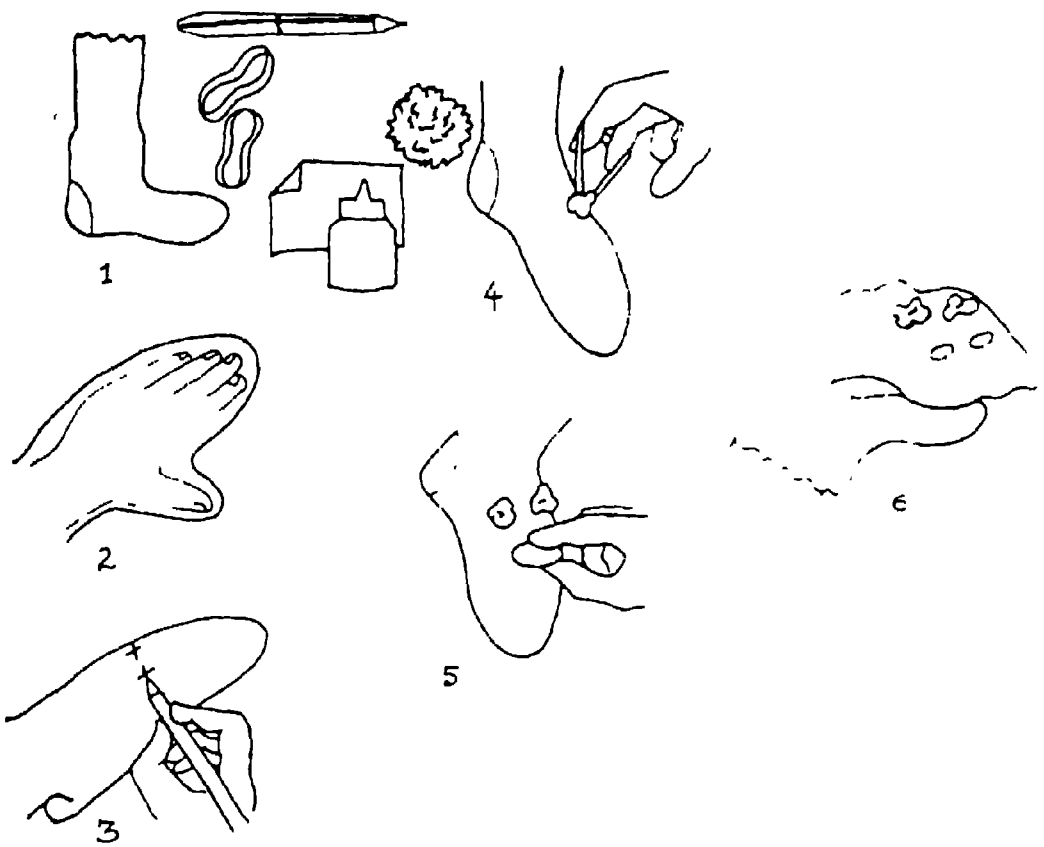
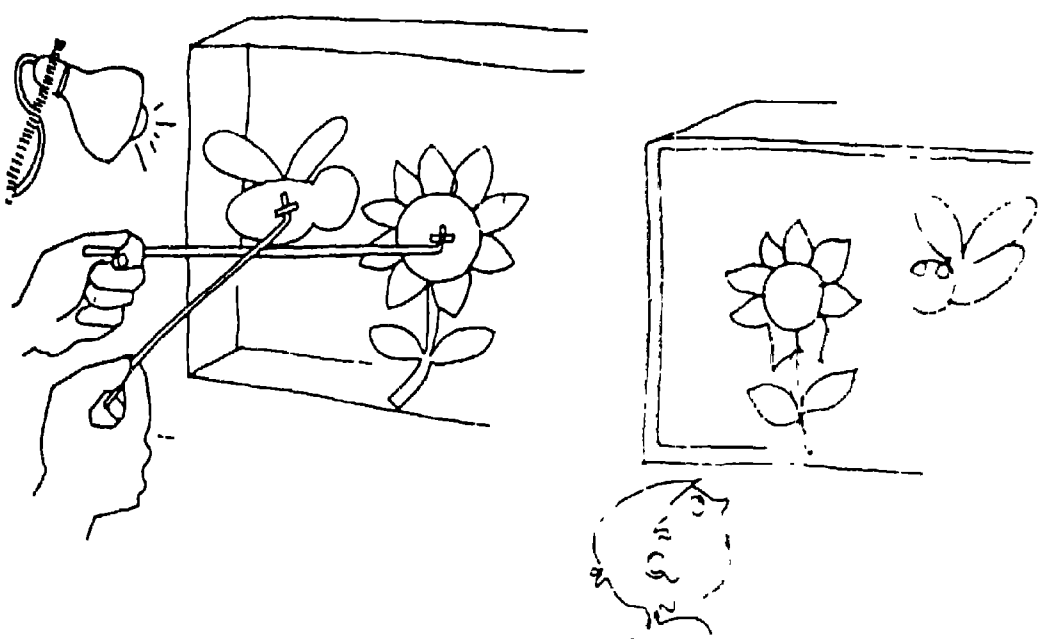



Fig. 5.10 How to make Glove Puppets.

d. Shadow puppets take more time to prepare and use, but they are equally if not more exciting. The required shapes are cut out of stiff, black paper and fixed to long wires. A large cardboard or wooden packing case with one end covered with well-stretched white cloth or tissue paper provides the screen. A bright lamp is positioned behind the screen. The puppets are manipulated so as to cast their shadows on the screen. The puppeteer needs to practise the presentation beforehand to avoid shadows of his/her hands falling on the screen, as also to move the puppets deftly. Coloured kite paper or cellophane can be pasted on to cut-out sections of the black paper for giving coloured shadows.



e. Teachers who are good at drawing can convert stories into small comic strips. Modern, urban children find such picture stories very attractive.

f. In schools which are not short of funds/equipment, a cassette recorder can be used effectively for a story-telling session. The advantage is that different voices can take on the different roles in the story and sound effects can also be added. This provides a great deal of added interest and is a valuable exercise in training children to listen. Audio cassesstes could also be used to record stories in the form of songs taking advantage of occasions when suitable accompanists are available. These, as also children's own efforts, can then be re-used over a longer period of time. Teachers should be constantly on the look-out for jingles, folk-songs and folk-tales which can be modified or used as a base for such work.

II. Games :

Games of all kinds provide an excellent means of re-inforcing the concepts learnt. Illustrative samples are given here:

a. Board Games: like Snakes and Ladders and the track game shown as a sample here can be easily adapted. They can be played by two or more players; usually four is a convenient group. The players use one or two dice and coloured counters - one for each person. The basic principle is a system of rewards and forfeits. The more complex variations of these games require players to answer a question or find a solution to a given problem. If the answer is correct/suitable the player is allowed to move forward, if not, he/she either remains in the same place or takes a specified number of steps backwards. Same rule applies for Snakes and ladders. To be able to climb a ladder or to avoid going down a snake, the player must answer correctly.

Here is a sample of a track game. Two or more players can play at a time. Use a different coloured counter for each player. Each player starts after throwing a '6'. Subsequent moves are after throwing a single die. The player who reaches "25" first is the winner.

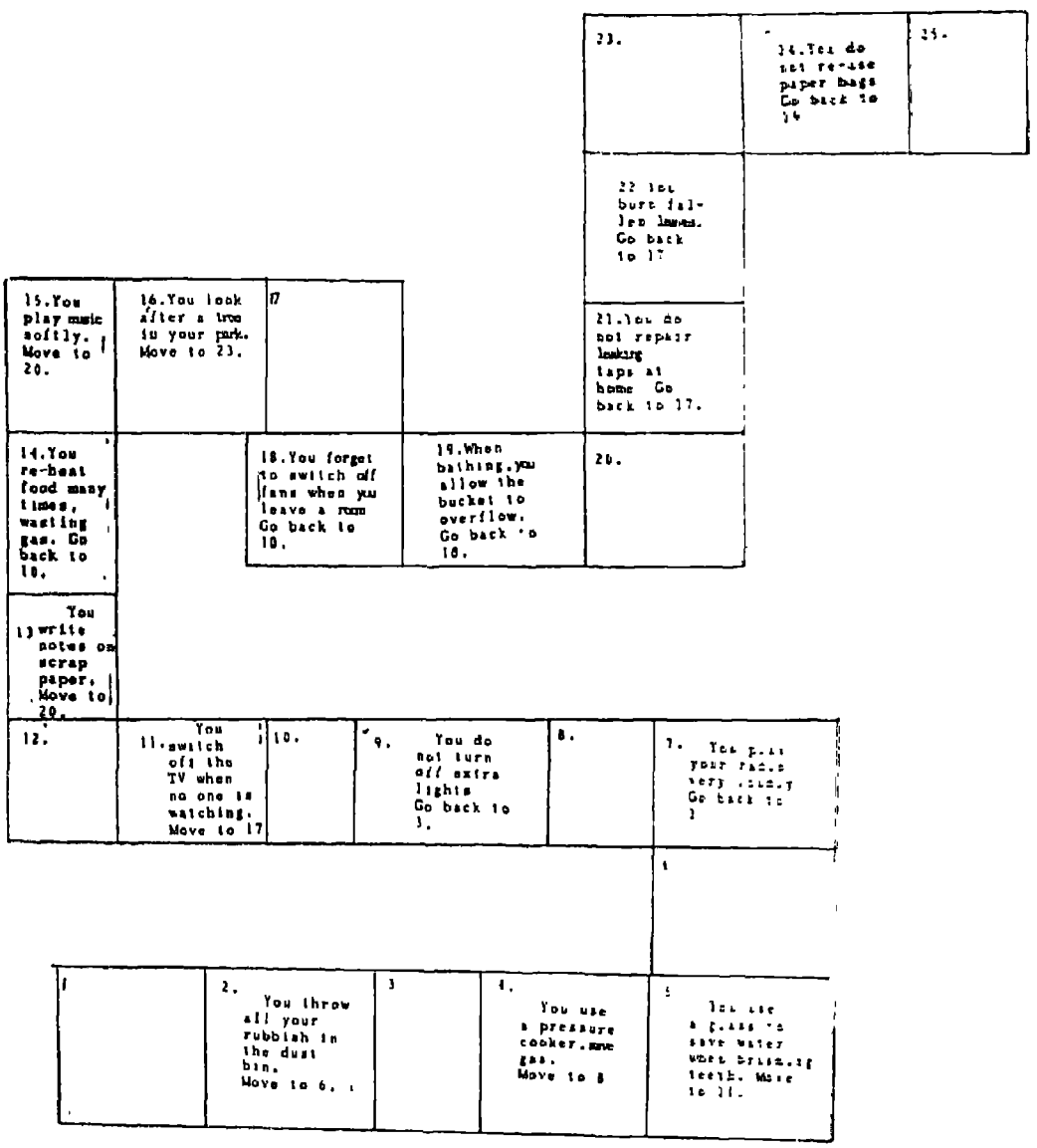



Fig: 5.12 A track game

The same game could be played another way. A set of 25 cards is prepared, numbered to match the square. After throwing the initial '6' which allows player to start, the player throws the dice again. Suppose his throw is a '5', he or she then picks up the card numbered 5 and answers the riddle on it. If his answer is correct he/she is allowed to move to square 5. If the answer is incorrect, the player is not allowed to move forward. Here is a sample set of riddles.

WHO AM I ?

1. I help control the number of rats which eat up valuable food. Most of my relatives are harmless, yet human beings are very scared of them.
2. If you see my insect traps in the garden covered with early morning dew, they look beautiful. Yet your mother knocks down all those that I build in corners of your house.
3. Most of my relations and I live on plant juices, but some of them prefer human blood. If they bite you, you might get malaria.
4. We love the warm, moist earth of your garden. You can usually see us after a shower of rain.

5 Yellow in colour, we can fly. We will sting you painfully if you break up our paper houses.

6. I live on both land and water. I love singing in the rain, "Croak..... croak.....croak."

7. Using my pointed beak as a hammer, I scoop out a hole in a tree trunk. There I lay my eggs and can bring up my babies in safely.

8. A night flier, I am not a bird. I live on small insects.

9. Live together with my relatives in a colony under the ground. Black and tiny, I can move quite fast. Won't you share your sweets with me?

10. I live in your home - in cracks and crevices, sometimes behind cupboards. You shoo me away, thinking I'am green and slimy. Actually I help you by eating up the insects in your home.

11. Brightly coloured wings take me from flower to flower, collecting nectar.

12. A flash of blue wings and a bright red beak are all you might see as I dive in water to catch my meal.

13. I usually hunt for insects near water. With my four transparent wings, I look like a helicopter flying.

14. Black and grey, wearing spectacles, you'll find me near houses. I'll eat almost anything you

throw away.

15. A hundred legs help me to move quite fast. If you come in my way you might get a painful bite.

16. hexagonal homes, hanging from a tree, there live my family and me.

17. Small birds and mice do I hunt for at night, helped by strong wings, hooked beak and good eyesight.

18. I don't like living in a coop, but that's where you've put me because you want my eggs.

19. Buzzing around your face, I can irritate you. You reach for a rolled-up newspaper and .... thwack! but when you look again, you find I have escaped.

20. A tree/climber am I with three broad stripes down my back and a bushy tail.

21. Feathered pets in many homes, you'll find us in several colours - grey, white and brown.

22. Green as the leaves I hide in, it is only my movement or red beak that gives me away.

23. I move slowly around in the moist, dark parts of your garden. If you frighten me, I'll hide in the home I carry on my back.

24. My skeleton is outside and my raised, curved tail has a poisonous sting at its tip.

25. Green and six-legged, my name contain the name of

my green habitat.

b. Jigsaw Puzzles : of varying complexity can be made. The cardboard covers of discarded notebooks can be neatly covered with white paper. Each could then have the picture of a tree painted/drawn or pasted on to it. For the very young, these cards need only be cut into three parts as shown here. The children can be required to assemble each tree completely. The name of the tree written below it helps in identification.

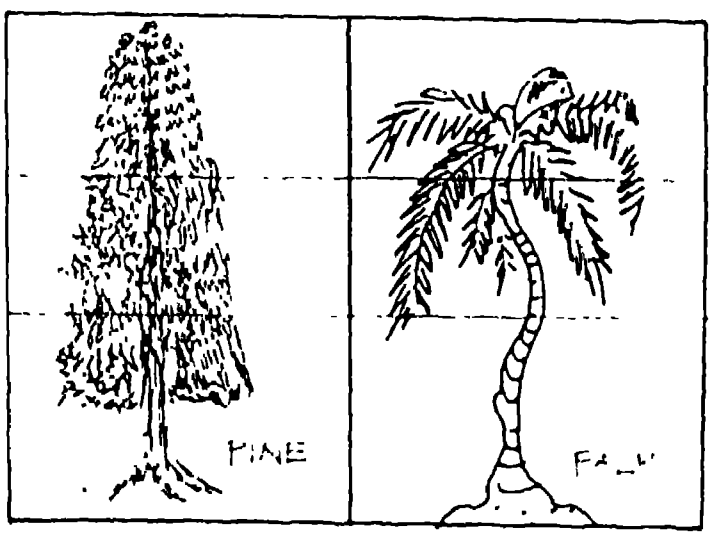



Fig. 5.13 Simple Jigsaw Puzzle

Building blocks can be used as a base for jigsaw puzzles. Two copies of a picture are required. One is cut up and pasted on the sides of nine or twelve blocks, as shown. The other is kept as a reference to help the child complete the picture.

For older children, each set of building blocks can give rise to six different pictures. This implies pasting one part from each of the selected pictures on one of the six faces of the block. This may prove a little difficult unless of pictures are coloured. The colours will help the students match the parts of a picture move easily.

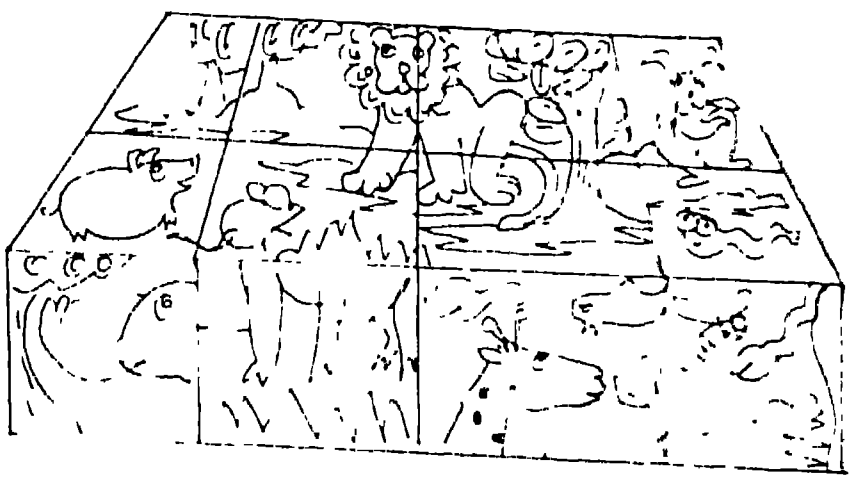


Fig. 5.14 Block - Jigsaw Puzzle

Yet another variation requires children to put together a given number of pieces in the correct order. This helps them from a chain.

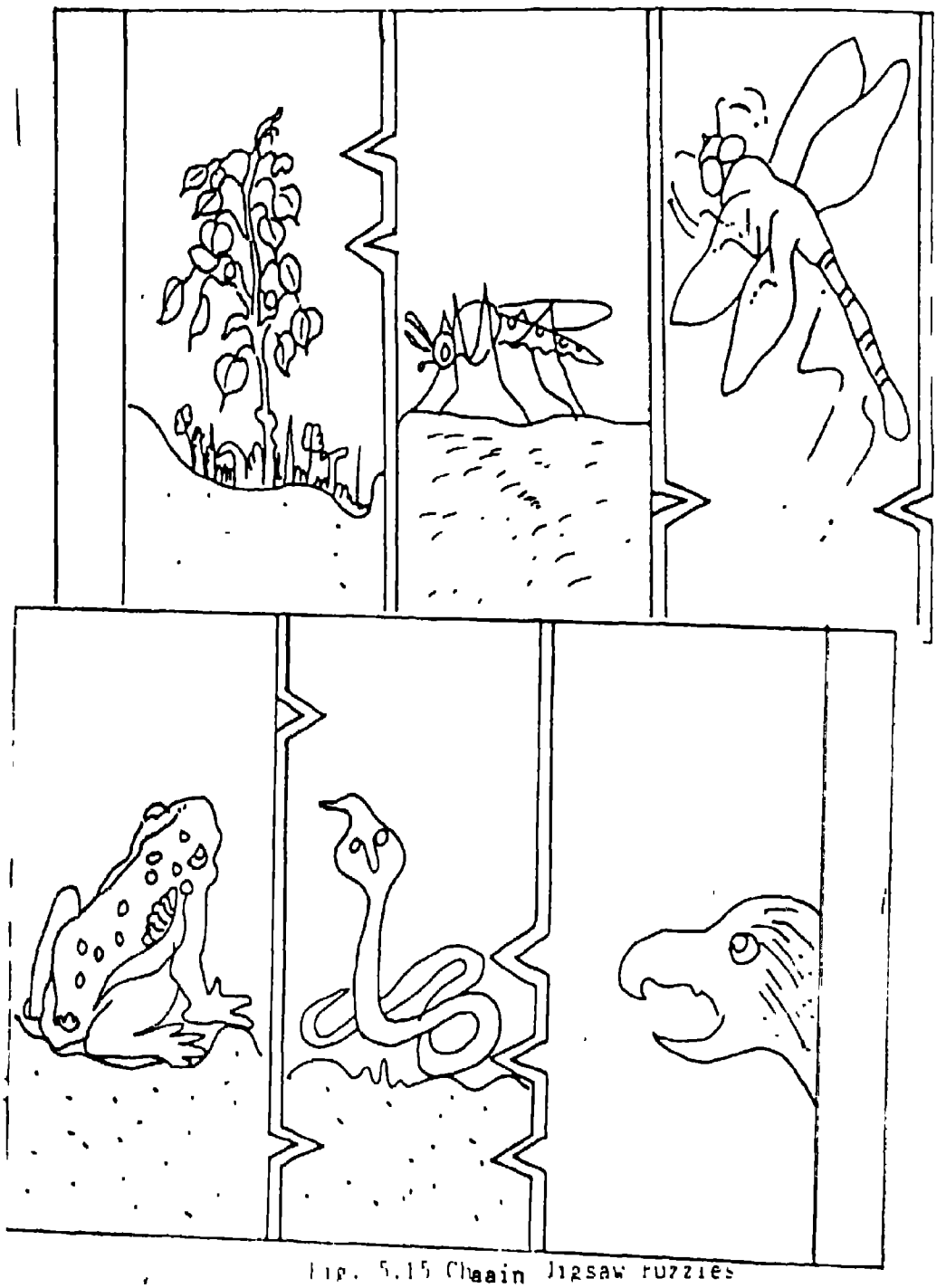


Fig. 5.15 Chain Jigsaw Puzzles

Apart from the food chain shown here, other linked events/things (living or non/living) can be put together in such chains. For example:

Sun - plant - cow - milk - cheese - man

sun - tree - tree dies - changed to coal - mined - fire - steam - railway engine moves.

Linear Jigsaws:

Another kind of jigsaw puzzle is shown here.
A large square is divided into sixteen small square. Adjacent inner edges of each small square have written on them, words which are associated with each other in some way. The outer edges also have words written on them. The puzzle can be made out on white paper and mounted on card. The required number of copies may also be made. The smaller squares are cut out, shuffled and a set of sixteen pieces is given to each pair of students. They are required to arrange the pieces so as to form the original square once more. This will mean looking for relationships between the words, some of which may match more than one word. However, the players will have to ensure that meaningful pairs are formed along every edge of neighbouring squares. The words along the outer edges serve as distractors, not being associated with any

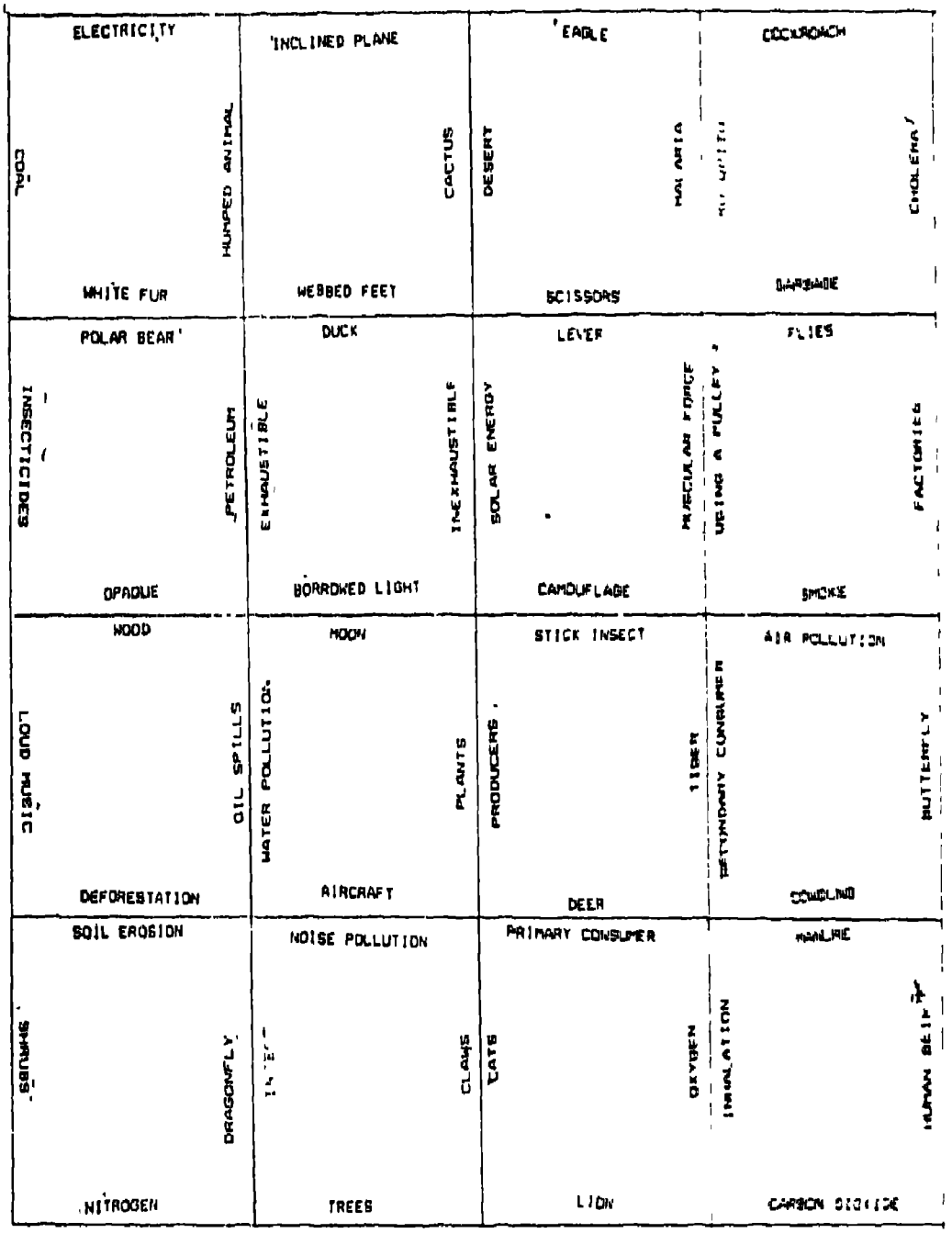



Fig. 5.16 Linear Jigsaw

other words. Care must be taken in preparing this puzzles to ensure that the pairs of words are clearly recognisable.

Dominoes: is a commonly played game, based on children's ability to recognise and match tiles bearing varying numbers of dots. The same game can be used in many other variations as an aid to learning. Some examples are given here. Teachers can use their imagination to develop several other variations.

How the Game is Played

Two to four children can play at a time using a set of 24 cards. The number of cards in a set may be increased at the discretion of the teacher.

Each card has two parts. The children are required to match the objects or words on the right half of the first card with the objects of words on the left half of another card. Note that on a single card, the two halves do not correspond with each other. The starter card is blank on the left side or may have an arrow on the left half. Correspondingly, the last card of the series is blank on the right side or may bear an

indication that the series ends with it.

The children from a group and sit down. The cards are shuffled and dealt out to the players. Each player receives an equal number of cards. They take turns to play, going round the group clockwise.

Any player can begin the game by putting one card face up in the centre. The next player puts down a card either to the left or the right of the first card. One half of the second card must match either the left side or the right side of the first card. Players continue in this manner. A few moves are shown in the sample.

If a player does not have a suitable card, he/she has to miss a turn. The game continues till all the cards are used up. In a non-competitive game no single player need be declared the winner, though this honour is usually reserved for the player who uses up all his/her cards first. The sample given below requires children to match pictures of the various stages in the life cycle of a butterfly with their names.(Fig. 5.17 see on next page).

Another set of 13 cards can be made, based on an energy chain. A combination of pictures and words or

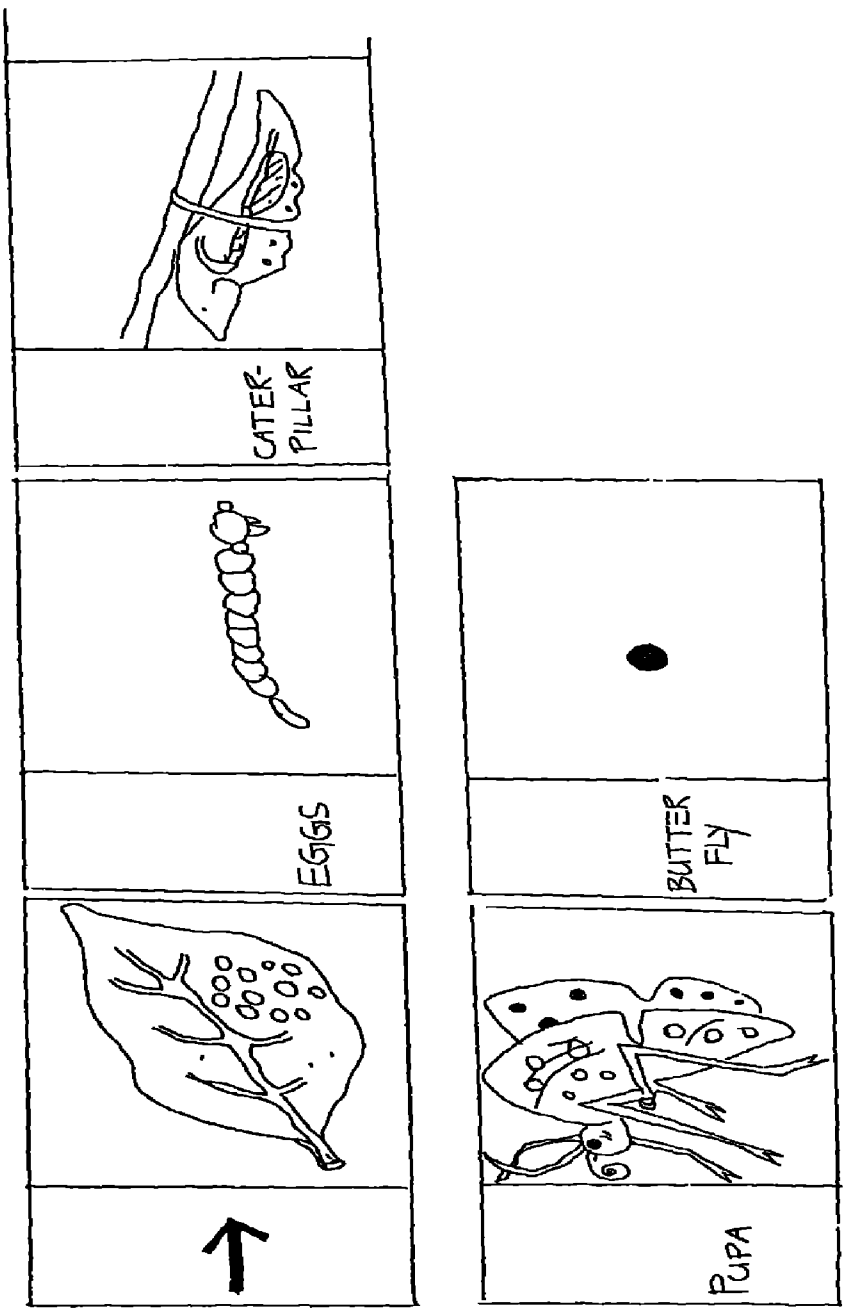



Fig. 5.17 Dominoes

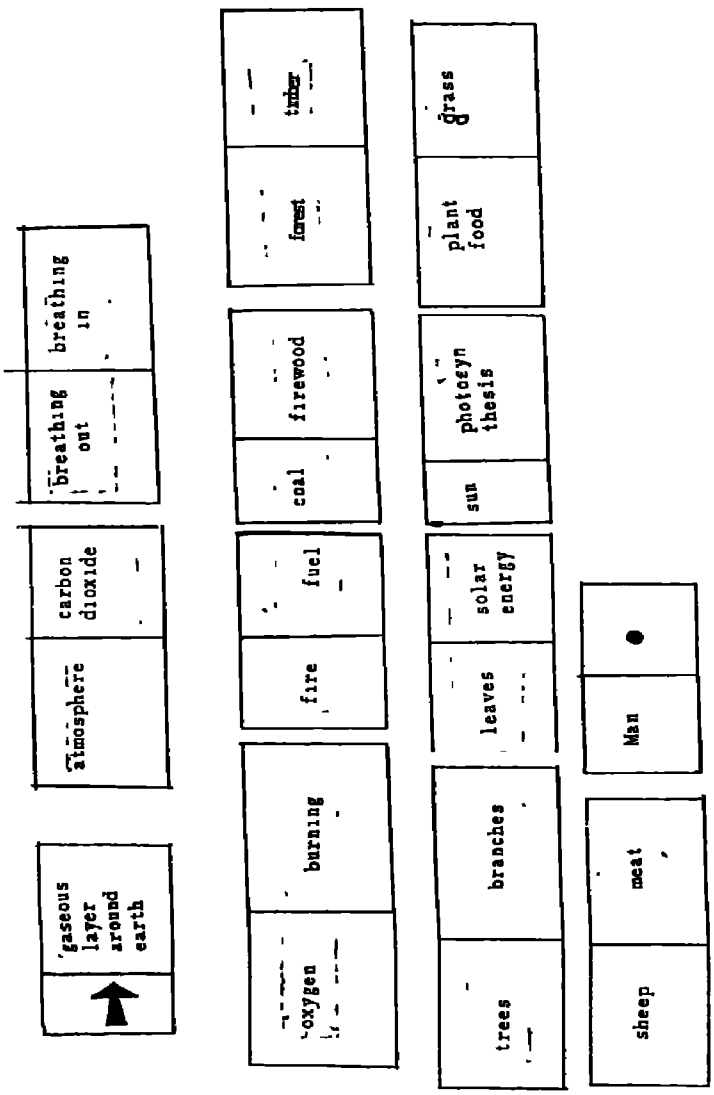



Fig. 5.18 Dominoes

only words may be used as appropriate.

Recognition of leaves, trees and animals, matching technical words with their meanings, matching animals with their food or habitat, matching cause and effect are some of the other possibilities which could be explored.

Here is a set of possibilities on "Good Habits" which might be further expanded.

| | | |
|---|---|---|
| 1. | Switching off extra lights and fans | Electricity saved |
| 2. | Using a pressure cooker | Cooking gas saved |
| 3. | Keeping wicks of kerosene stove clean | Kerosene (fuel) saved |
| 4. | Doing many jobs together on a trip to the market | Time and Energy saved |
| 5. | Using left-over food items | Food saved |
| 6 | The family eats together | Food heated only once-fuel saved |
| 7. | Buying things only when you need them | Money saved |

| | | |
|---|---|---|
| 8. | Pouring water used to clean floors on to plants. | Saving water |

Making a list of relationships like this is the first step in planning a set of dominoes. In writing them out on cards, it must be remembered that one part of each pair must go on to two different cards. The first and last cards will have a blank half each. The blank side of used invitation/greeting cards are useful for making domino cards. They should be cut into cards of the same. size. A thick line dividing each card into two parts is drawn. Another thick line drawn along the edges makes the final product look neat and well-finished. If they are enclosed in clear, polythene bags, they can be re-used over a long period by the children. It would be best to try out each set of dominoes on other adults, before putting them out for the children's use.

**Lotto:**

The game of Lotto (also known as Housie or Tombola) usually played by adults, can be adapted in variety of ways for use in a classroom. It will essentially be of use in drilling and in testing the quick

recognition of items by students. A teacher could prepare a large set of cards where each child in the class takes one, and the teacher herself calls out the numbers or words to be ticked off on the child's card. Alternately, students could work in small groups of six or eight where one leads the game. This could be one way of occupying those few minutes at the end of a period when there is not enough time to start something new; the children having finished their allotted quota of work are inclined to be restless. It would add interest and perhaps prove an incentive to learning.

An imaginative teacher could find many other ways of using this game.

Suppose we wish to get the children to practise recognition of leaves. The names of the selected leaves can be written in a variety of combinations on small cards to be given to the children one per child. Each card is divided into six or more compartments and one name is written in each compartment. If desired some compartments may be left blank. The teacher's set consists of flash cards on which are drawn or pasted large, easily visible pictures of the leaves.

The children's cards are given out, and as the teacher or leader hold up each card from his set, the child marks that particular answer on his card. If the cards are to be re-used, they could be made out of stiff cardpaper and covered with transparent sheets. Children could use buttons or other markers to avoid making pencil marks on their cards.

It is necessary for the teacher to keep a record of the flashcards shown, in the order that they were held up. The child who first completes a vertical, horizontal or diagonal row raises a hand and brings his/her card up to the teacher for checking. The game may proceed until the entire set of teachers cards has been used up. At that point, every student should have identified and marked all the names on his/her individual card.

The game may be extended to identifying related objects/events e.g. bees/honey, sheep/wool; trees/wood; spider/web. With older children the clues may be verbal in nature. Thus a list of trees could be prepared and their names put down on the children's cards. A matching set of clues is made describing the trees. For example:

i) A very common, useful trees. Its twigs are used to brush teeth. Its leaves are used as medicine and to protect wollen cloths. (Neem)

ii) A tree whose hard wood is used to make furniture (teak)

iii) A tree whose long, edible, sour fruit are dried and used in cooking (tamarind).

Teachers should explore many possibilities of this game.

Tic Tac Toe or Noughts and Crosses:

This game, popular amongst children' the world over, can be adapted as a means of testing/revising concepts and getting children to think about problems.

The frame can be drawn on a blackboard, made out of paper/ wood and fixed on a suitable base where it is visible to the entire class (refer fig. 5.19). The class is divided into two teams, one being represented by the circles and the other by the crosses. If desired a selected number of players may make up the teams and a time limit imposed for the answering of questions.

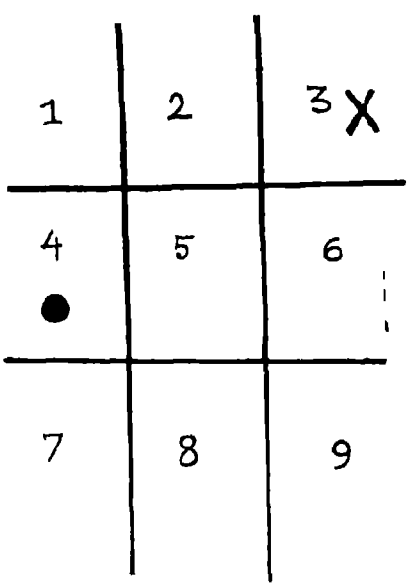



Fig.5.19

Each team in turn is allowed to choose the location at which it plays its circle/cross. In order to be allowed to place it there, the team members must answer a question correctly. Questions are picked out at random from nine boxes, numbered to match the nine available positions. Each position is allotted a theme and a set of questions prepared based on that theme. There may be direct, content-oriented questions or where possible may pose problems to which students are required to suggest solutions.

The winning team is the one which gets three circles/crosses in a row-horizontally, vertically or diagonally answering the questions, the students have to devise a strategy for winning. A few themes are given here:

Theme 1 : PLANTS

1. In what way are plants different from other living things?

2. Name one type of plant that can move from place to place.

3. What conditions are essential for the germinatio

of seeds.

4. Why does lime water turn milky in a jar containing germinating seeds?

5. Name two medicinal plants.

6. The leaf of a potted plant is covered with a polythene bag and it is left for about one hour. What do you expect to see?

Theme 2 : ANIMALS

1. Why is a frog able to jumps large distances?

2. Why does the body of a fish have its special shape?

3. How does a fish breathe under water?

4. What helps a duck to swim in water ?

5. How does white fur help a polar bear?

6. Name the world's
   i) Largest mammal

ii)Largest land animal

Theme 3: **KEEPING HEALTHY** .

1. Why to necessary to boil drinking water.
2. Water which looks clean may not always be fit for drinking. Why?
3. Why should rain water not be allowed to remain in empty discarded containers?
4. Name three diseases that can be caused by dirty surroundings where garbage is not cleared.
5. Name three diseases which can be prevented by innoculations.

Theme 4: **CONSERVATION**

1. Give one way in which you can save water at home.
2. Give one way of using the paper in your notebooks more carefully.
3. Suggest one way of making your bath soap last longer.
4. Why should you switch off lights and fans when you leave the classroom?
5. Suggest one way in which you and your family can save cooking gas.
6. What can be done with leaves, cut grass etc. other than burning them?

Theme 5: POLLUTIION

1. How can you listen to music without disturbing your family and neighbours?
2. Apart from adding smoke to the air, in what two ways is smoking harmful?
3. Give one example of a way in which an factory can pollute water supplies.
4. How does planting trees help to keep the atmosphere "healthy"?
5. State in which ways pollution can affect your own life?
6. State two ways in which pollution of drinking water can be prevented.

Theme 6: NATURAL RESOURCES AND WILD LIFE

1. Why is large-scale cutting down of forests harmful to the environment?
2. Name Indian animals that are protected by law to save them from extinction.
3. Name two Wildlife Sanctuaries in India and one important animal found in each.
4. Name the national bird/animal/flower of India.
5. Where in India would you see the flamingo and the rhinoceros?
6. What is a Sanctuary ?

**AN OUTDOOR GAME:**

Material Required: Postcrds/Pictures each cut up into six to eight pieces. The pieces are to be mixed up and put into envelope. The class is to be divided into groups, each consisting of five or six students. Each group will require on envelope.

HOW TO PLAY:

The teacher takes the groups out into an open area and gives one envelope to each group.

Teacher: Each group has got an envelope with some pieces of a picture. I want you to complete your picture as quickly as you can.

Now the teacher steps back and watches the groups in action. Invariably, as soon as the students realise that their picture is made up of unmatching pieces, they guess that the other pieces they require will be found with the other groups. The run around trying to locate their missing pieces. Two or three kinds of behaviour are likely to be observed by the teacher:

i. an exchange of the picture pieces - "You give me one and I'll give you one."

ii) a handing over, willingly, of pieces that are of no use to a group - "You take this , it is no good to us."

iii) grabbing and taking of whatever a group needs and/or holding on to pieces which they do not require - merely to deprive others. The idea is to come first, regardless of all other considerations.

After the groups have made up their pictures, the teacher should through discussion analyse what they did, relate it to life situations and point out how the same kind of cooperation/coexistence (between us and other living things and in our use of limited resources) is necessary for us to live in harmony on earth.

## II. WORD PUZZLES

These can take many shapes. Two samples are given below. Children not only love solving such puzzles, they enjoy making them and trying them out on their friends - a set of inter-locking words. A Word Ladder is perhaps easier for classes IV and V level than a full-fledged crossword. The clues should be simple and straight forward. They may be pictorial, verbal or even small questions/riddles. Young children would find it difficult to cope with anagrams and complicated clues.

Such puzzles can be composed in regional languages as well. Word puzzles are an interesting way of testing facts.

A WORD SEARCH SQUARE

There are fifteen environment related words in this square. To find them you must look horizontally, vertically and diagonally.

| W | S | Z | P | O | X | Y | G | E | N |
|---|---|---|---|---|---|---|---|---|---|
| X | C | U | B | L | M | W | E | L | Q |
| C | A | R | N | I | V | O | R | E | S |
| A | V | T | I | N | U | R | M | A | H |
| N | E | H | L | C | D | M | S | F | S |
| I | N | U | F | I | C | P | X | A | T |
| N | G | M | B | S | O | M | C | S | A |
| L | E | U | B | O | W | N | L | Y | R |
| Z | R | S | G | R | A | S | S | Z | C |
| V | S | L | U | S | M | P | Q | R | H |

Fig. 5.20 Word Search Square

If desired the following clues may be made available. They have deliberately not been categorised in any pattern.

1. It eats all kinds of rotting food
2. Rabbits' teeth
3. Another name for bacteria
4. Meat eaters
5. The source of all energy
6. The result of photosynthesis
7. Main food of herbivores
8. Slimy, it lives in the soil
9. Teeth for tearing meat
10. Producer of plant food
11. Gas that is vital for life
12. King of the jungle
13. Rotting vegetable matter that keeps the soil fertile
14. Water - living animal-found in large numbers all over the world.
15. The young one of a big cat.

Answers: Scavengers, incisors, germs, carnivores, sun, starch, grass, worm, canine, leaf, oxygen, lion, humus, fish cub.

A CROSSWORD

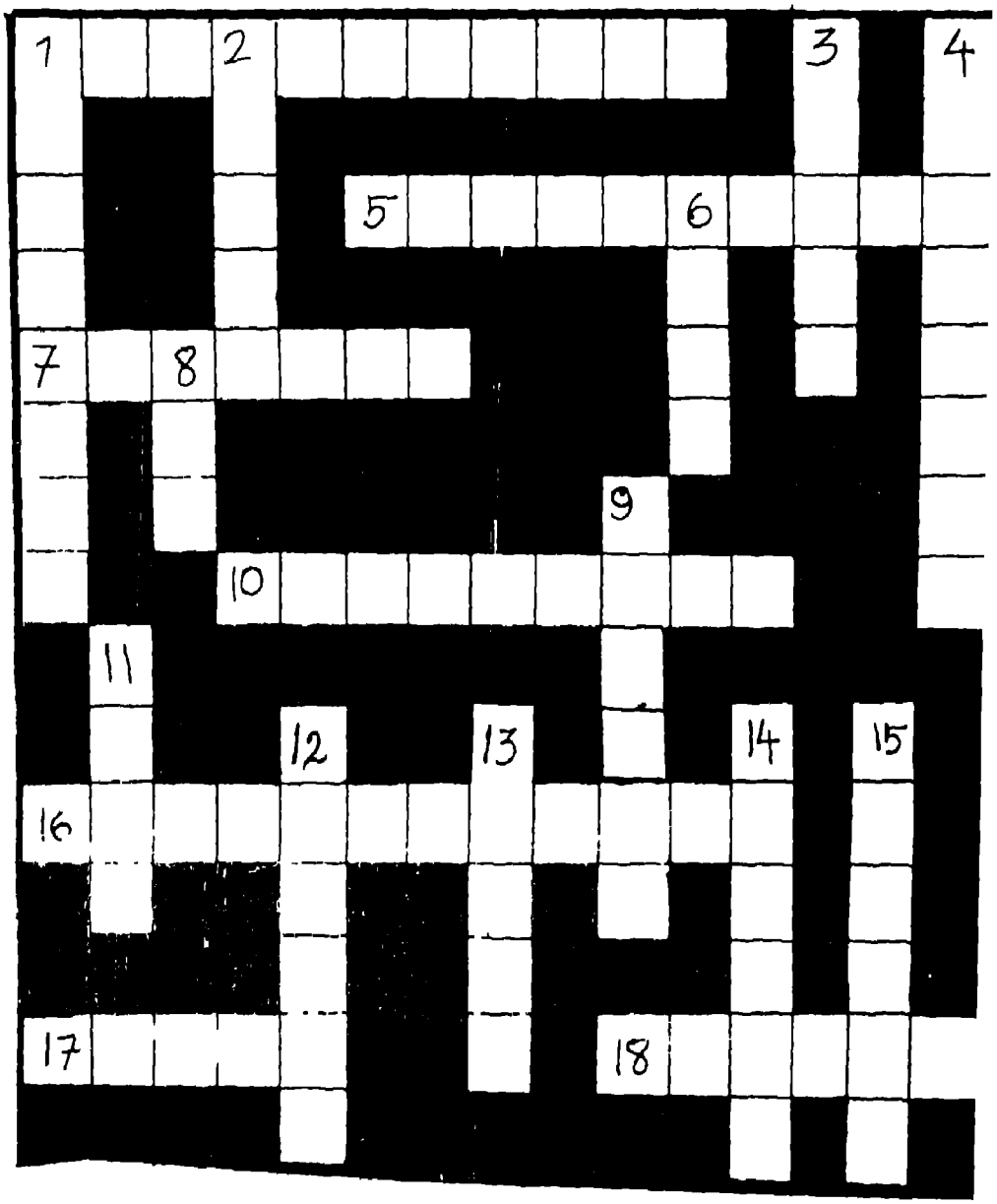



Fig. 5.21 A Crossword Puzzle

C L U E S

Across

1. Common source of energy, it runs many machines.
5. the art of hiding
7. Where one lives
10 Farmer's friend
16. Saving materials and energy.
17 Birds with webbed feet live there.
18. Food for bees.

Down

1. Large mammal, widely hunted for its teeth.
2. Prickly plants
3. World's largest mammal
4. Hunter, looking for prey
6. Burnt to supply energy
8. Night flier, equipped with radar
9. Remains of ancient animals or plants.
11. It links the animals in a web.
12. Place with little water.
13. Save this to save trees
14. Pollinator of flowrs.

15. Kingdom to which you and I belong.

ANSWERS: Across: 1. Electricity, 5. Camouflage, 7. Habitat, 10.Earthworm, 16. Conservation, 17, Water 18.Nectar

Down : 1.Elephant, 2. Cacti, 3. Whale, 6. Fuel, 8. Bat, 9. Fossil, 11. Food, 12. Desert 13. Paper, 14, Insect. 15. Animal

**Using Newspaper and Magazines in Classroom Teaching**

Motivating children to read newspapers and magazines can be achieved by devising teaching strategies which incorporate in them, the use of such a medium. Given below are a few examples of how environmental concerns and issues could be woven into the curriculum through newspapers and magazines.

1) Ask the children to collect photographs of landscapes distroyed due to such natural calamitesas floods, drought, famine, earthquake cyclones etc., Organise the class discussion on the effect of such natural calamities on the environment e.g. shortage of safe drinking water, shortage of food, loss of crops, incidence of

epidemic of water - borne and disease, etc. Depending on the age and ability of the children, teacher can even lead the discussion to causes of these natural disaster and also the ways in which these can be either prevented or measures can be taken so that loss of the life and property is minimum.

2) Children may be asked to collect news items on different environmental problems and issues that appeared in the newspaper during a month. Let them classify these news items into different categories e.g. some news items may relate to incidents of out-break of water and airborne disease, degradation of soil due to mining activities, in discriminate cutting of trees, pollution of air and water. Children may be asked to discuss this issues and suggest measures which will help find solution to these problems.

Teacher should encourage the children to read newspapers and magazines and note down the words they come across which has environmental connototation and meaning or those words in a dictionary and prepare glossary of the same.

Teacher may also make use of wild-life magazine and literature and make a list of species and use the same in a classroom discussion on why these animal are protected? What role do wild-life sanctuaries and National Park play in protecting wild- lives. Interesting news items and attractive photographs with massages on environmental protection can be displayed in the bulletin board and children may be asked to find out more information about these news items.

## Versatile Uses of the Overhead Projector

The Overhead Projector as a teaching aid has not been fully used, even in schools that have this equipment. Where they do use it, only plain text or illustrations are projected. Though this use is helpful but more versatile use of an overhead projector can certainly have a greater impact on the minds of children. Given below, are some techniques for the use of the overhead projector.

## The Overlay Technique

Where a topic lends itself to teaching in a sequence, this technique is very useful. The steps in the presentation are built up one by one by laying one transparency over the other. The final projection would give a comprehensive picture of the topic one is dealing with. This technique is ideal

when one has to do revision of the whole topic, since the transparencies can be removed and replaced, as many times as is required. An example of the overlay technique is given here.

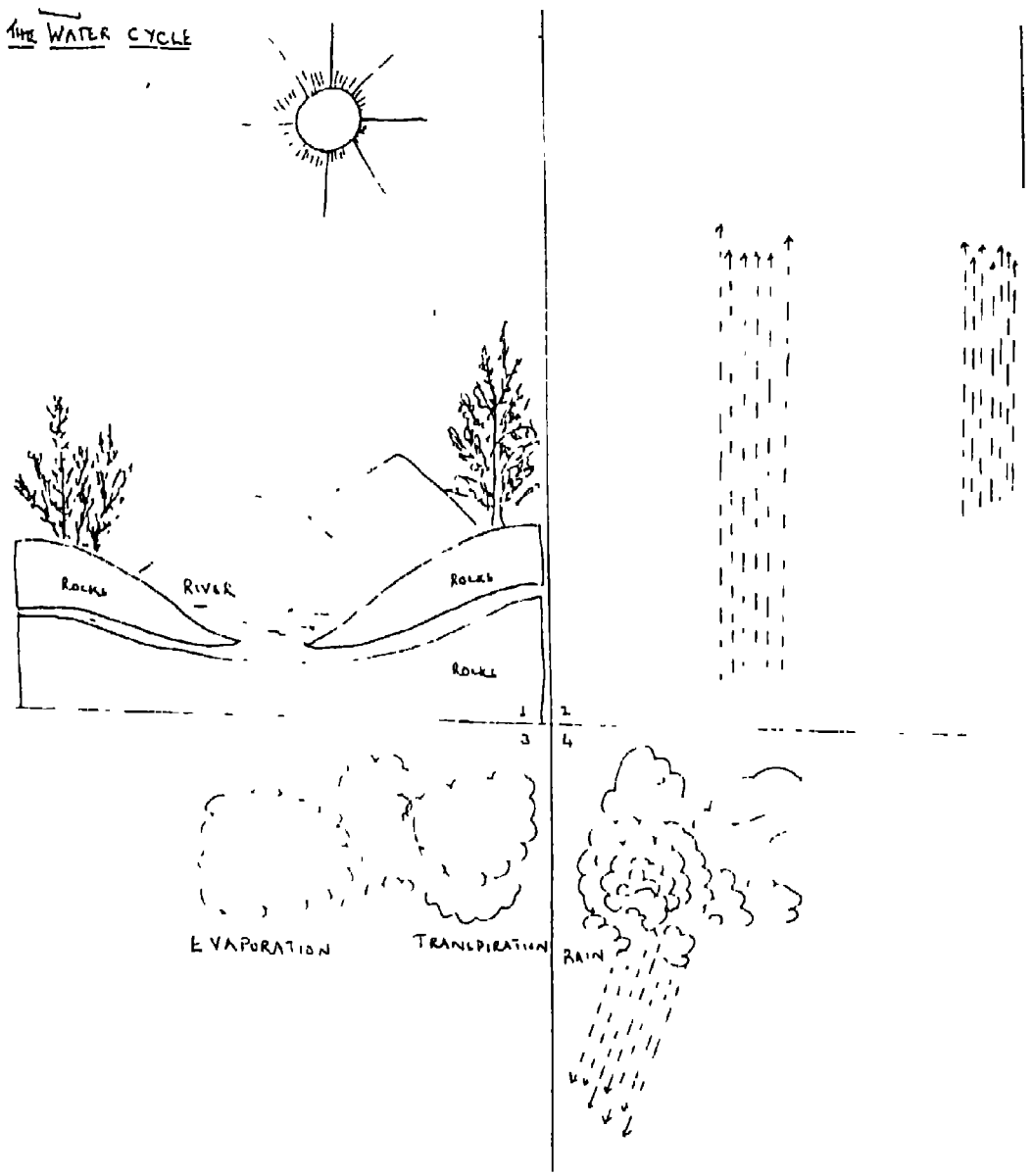



Fig. 5.22 Water Cycle - Overlay Technique

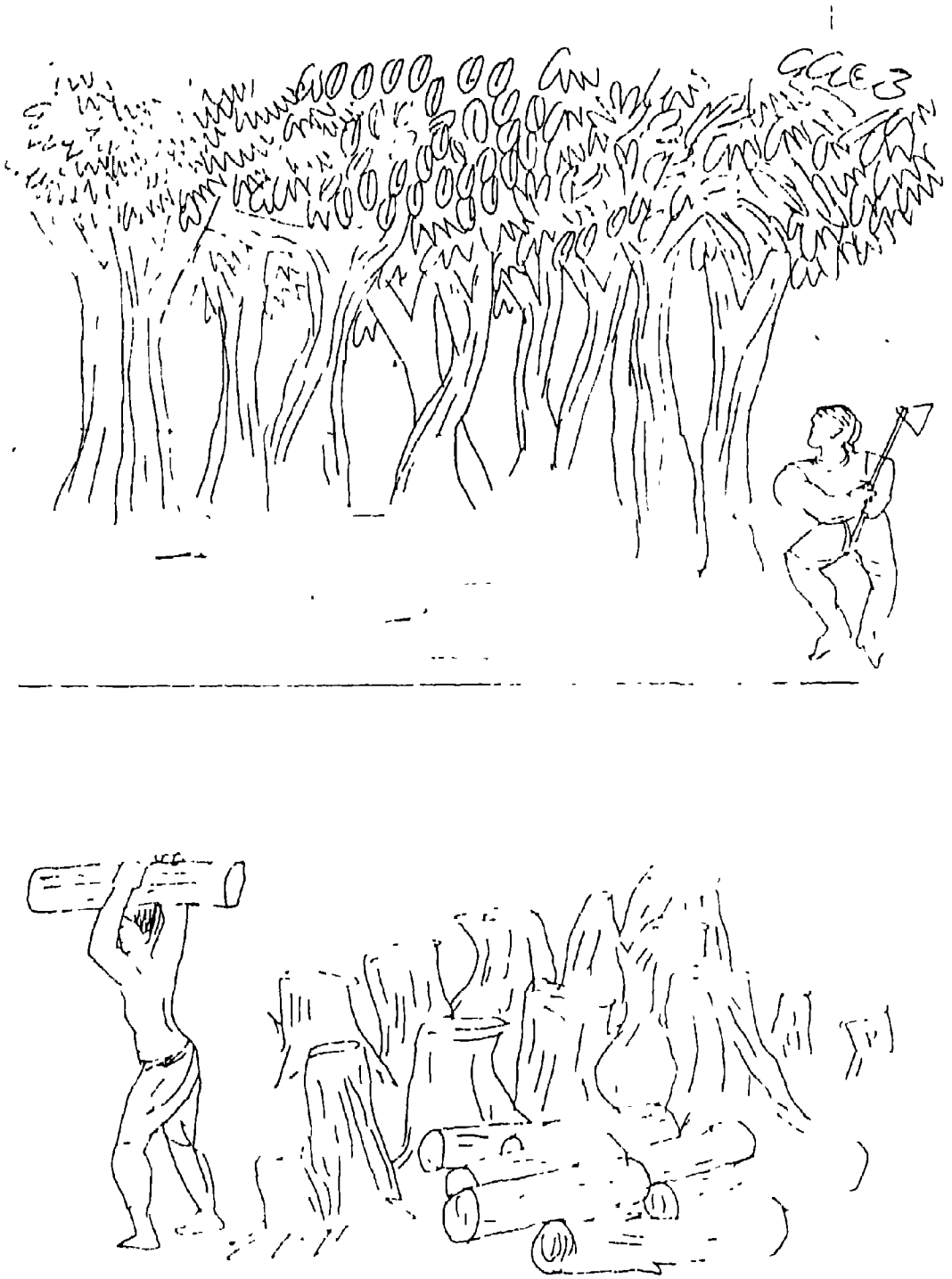


Fig. 5.23 Effect of the Deforestation.

How to Make an Overlay

1. Take opaque paper. Make cutouts of rock from it. Paste the cutouts on the transparency. Draw the rest of the illustrations with a marker pen.
2. Take another transperency. Align it on the top of the first transperancy. Draw arrows going up.
3. Take a third transperancy. Align it on the second just above the arrows. Paste a thin layer of cotton wool to simulate the effect of clouds.
4. Take a fourth transparency. Align it on the third to the left of the cloud. Paste thick layer of cotton wool, to simulate dark rain bearing clouds. Draw arrows down for rains.

The masking Technique

Anticipating the occurence of something unknown or uncertain, is an enjoyable experience that children love to go through. The suspense factor stimulates their creativity and the outcome can be very satisfying.

The overhead transparency can be filled with the required information in the form of text or illustrations. This method is well suited to text/illustrations which are sequential in nature, e.g., the events in a story. The information which is masked partially/totally is opened up and presented in the correct sequence. Masking can be done by any paper which is opaque. This shuts off light and prevents the matter on the transparency being projected on to the screen. As the story is revealed step by step interest of the children is sustained.

How to make:

1. Take a transparency fold it into two halves.
2. The lower half of the illustration can be masked by the opaque paper.
3. After the teacher gives the explanation for the upper half, she can immediately remove the masked portion and show the content.

Sliding Technique:

Simulating movement in real life situations can be achieved by this technique. Though the main focus

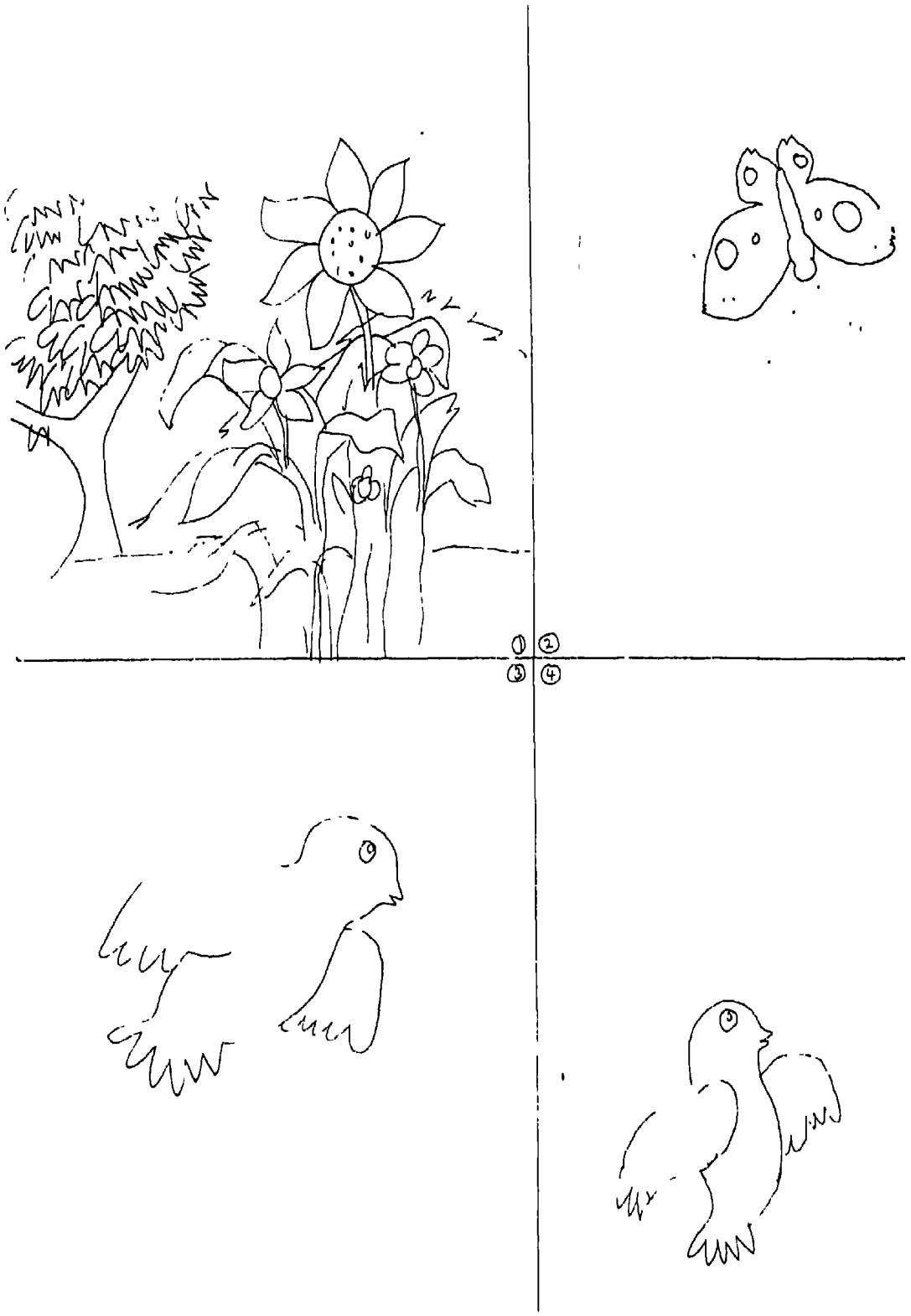



Fig. 5.24 Camouflage - Sliding Technique

is in sliding the transparencies one over the other, the other techniques of overlay and masking also come into play.

Camouflage is an interesting topic that can be taken up to show this technique.

A short story can be built up around this topic like

1. A garden
2. A butterfly comes flying to suck nectar from the flower.
3. The bird spots the butterfly and comes swooping down to catch it.
4. The butterfly quickly flies and hides itself behind the flowers thus camoflaging itself.
5. The bird comes down and searches for the butterfly but cannot find it.
6. (transperancy 3 is reversed to get a movement in the opposite direction) The bird is disappointed and flies away.

Silhoutte Technique:

Silhouttes/shadows are presented either by pasting

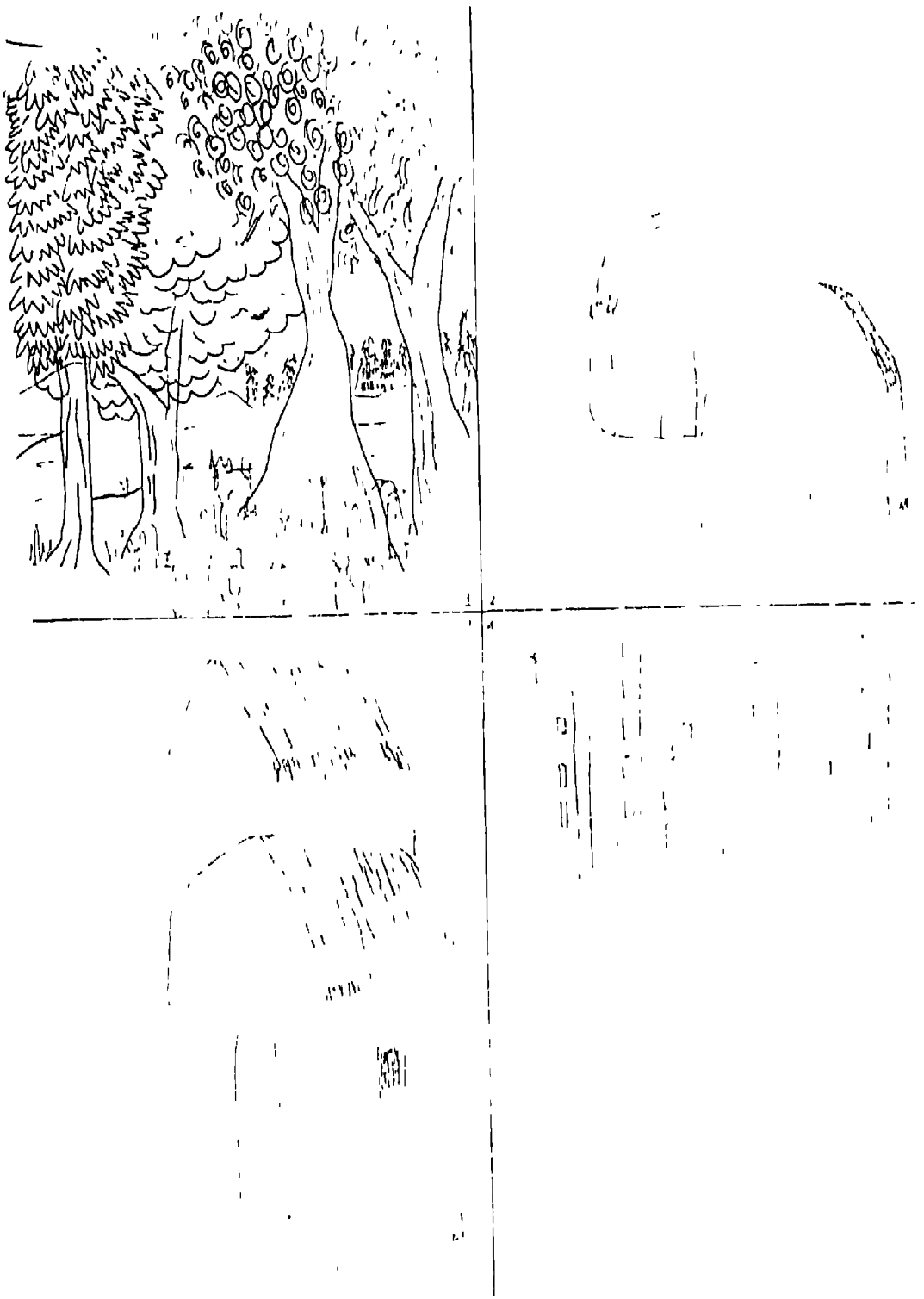


Fig. 5.25 Silhouette Technique

opaque cutouts on the transparencies, or by placing objects on the glass stage of the projector.
A very creative teacher can exploit this technique to bring out the best talents among children. This technique lends itself to story telling and creative writing. In fact, when combined with the overlay or sliding technique, it can produce animation which brings the presentation to life. The effect of deforestation can be shown as follows. The first transparency shows a forest. If desired ,cotton wool may be pasted on for clouds. Each of the overlays has paper cut-outs pasted on it. These opaque silhouttes mask the forest, which is finally replaced by a concrete jungle.

These are overlays in sequence, showing urbanisation that destroys the green belt. Overlays 2,3,4,5, could be cutouts from opaque paper pasted on the transparencies. Windows could be slit/opened up in the paper. Cloud can be stimulated using cotton wool.

Using Real Objects:

The teacher who faces a large class gets frustrated trying to show on objects and explain their

parts/functions. The OHP comes in very handy in such situations. For example, a plant with its leaves, stem, buds, flowers and roots can be placed lying flat on the stage. When projected, even the tiny roots are seen very clearly on the screen. Objects like scissors and nut-crackers when placed on the stage are projected clearly as silhouttes. and they can be moved to show their functions as levers.

A glass trough containing water is placed on the stage, and a few drops of ink added to colour the water. When a tiny stone is dropped into it, water waves are produced causing ripples moving outwards from the centre, to the rim of the trough. When teaching a lesson on 'Sound', the teacher could compare sound waves to 'water waves'.

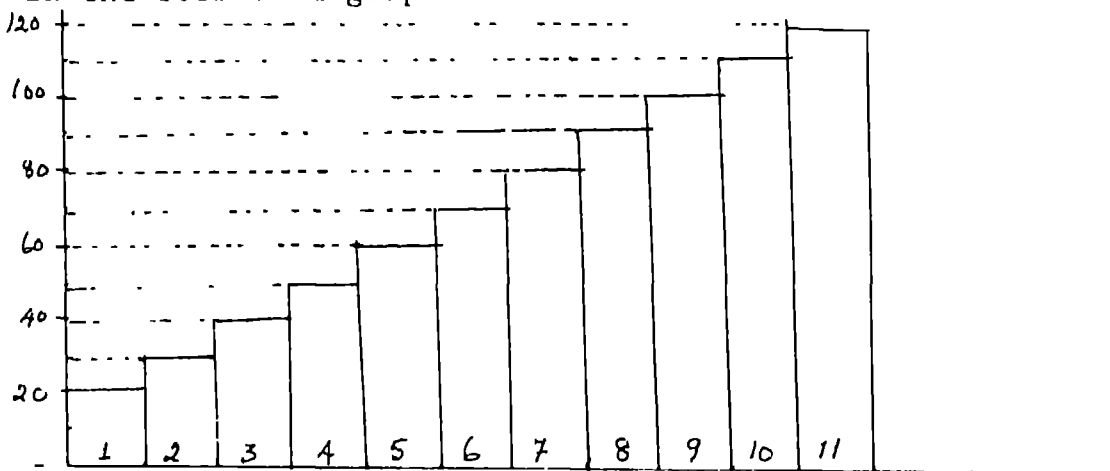
Eventually, of course, it would be upto the ingenuity of the teacher to think of the ways and means of using this medium to the maximum.

Correlating Information in Magazines with mathematics:

Environmental Concern : Noise Pollution

Background information to be given to students:

Any disagreeable or unwanted sound - whether it be a radio blaring, buses honking or a passing aeroplane 0 is called noise. This noise affects us everywhere - whether at home, at work or out in the streets. The level or loudness of noise is measured in 'decibels'; this loudness (measured in decibels) of some typical sources is shown here. This is shown in the form of a graph.




1. Broadcasting Studio
2. Quiet room, leaves rustling
3. Quiet living room
4. Busy street through closed windows
5. Busy street - open window
6. Outdoor noise level
7. Busy crossroads
8. Lorry, motor cycle
9. Pneumatic drill (at a distance)
10. Pop music group
11. Aircraft at take-off

Activity : Students may be asked to draw this bar graph and questions may be asked in the given data.

1. Which is the minimum decibel level, after which sound becomes noise.
2. If you stand near a busy cross road and suddenly four lorries and two motor bikes passby, by how much will the decibel level increase?
3. Why do you think the decibel level in a broadcasting studio is very low?
4. You are listening to a pop music group. Suddenly, at the airport, not far off, you can hear an aircraft taking off. The difference between the decibel levels of these two 'noises' is the same as that in question 2. Which is more tolerable ? Why ?
5. Which place would you choose if you have to do your homework ? Why ?
6. It is said that a factory worker's exposure to noise level is higher than the noise level your mother is exposed to, at home. Why ?
7. Express the decibel level of a pneumatic drill as a percentage of an aircraft taking off.
8. Find out how, high decibel levels of noise

affect hearing ?

9. Compare the noises that you are exposed to through your day of 24 hours with the noises given here. Make up your own graph of decibel levels for a day of yours.

# CHAPTER - 6

## ORGANISATION AND MANAGEMENT OF ENVIRONMENTAL EDUCATION ACTIVITIES

In Chapter 5 general guidelines for teaching learning strategies along with a few illustrative examples of techniques such as story-telling, games, use of Audio Visual aids etc. were discussed. This Chapter will ideal with organization and management of activities related to environmental education.

Organisation and management of activities are important factors that contribute to the success of a teacher who is entrusted with the responsibility of imparting Environmental Education. A variety of pedagogical approaches to curriculum organization in Environmental Education have already been discussed in Chapter 3. By and large, in most parts of India, a primary school teacher is a generalist, meaning thereby he/she in-charge of the total curriculum for his/her class. Thus he/she has far better control over the total curriculum as compared to his/her counterpart at the secondary level. He/she can organise activities related to Environmental Education by keeping the total curriculum in view. That is why multi disciplinary approach is more suited at this stage. However, the ultimate goal should be to make children' environmentally' 'literate', meaning thereby that a child should be able to function in the society and adopt a life style which would enable

him to operate in his environment in a more effective manner.

Since teaching-learning activities have to be largely interactive in nature, the management of such activities should be carefully planned out. The teacher's role should be that of a guide and a facilitator. He/She must encourage children to bring their own ideas into the classroom. The teacher should encourage children:

- to ask questions and raise honest doubts about objects, events, phenomena in his/her environment which he does not understand;
- to search for data, order the data systematically in order to interpret the same and not to take any explanation for granted;
- to develop rational thinking;
- to develop a concern about the consequences of his/her own actions, particularly, those which adversely affect the environment (e.g. action that pollutes water and air, wastage of resources, indiscriminate trampling of plants, harm to animals, etc.);
- to develop a sense of commitment towards one's fellow human beings;

- to take individual steps on collective action and participate in activities organized in school and outside school related to environmental protection (e.g. taking part in cleanliness drive taking part in child-to-child activities related to health monitoring; care of plants and animals including pets, tree planting etc.).

Organization and management of environmental education programmes will also cover the commonly practised steps of **planning, development, implementation** of activities and ultimately the **evaluation** of pupils' achievement.

**Planning:**

Any teaching-learning activity needs to be structured very carefully. For this, an outline should be developed meticulously.

The teacher must first formulate a set of objectives and spell them out in terms of specific learning outcomes expressed in behavioural terms. These learning outcomes should be spelt out in respect of knowledge of facts/ information; understanding of concepts, principles and generalizatins; skills for problem solving; and a set of values and attitudes to be developed for applied learning.

**Development and Implementation:**

After spelling out the specific learning outcomes the teacher should note down clearly, different aspects of organisation and management of activities. For example - list of prior instructions to be given to the pupils, materials required for the activity, etc. The classroom organization for environmental education activities is conceived of as a truly exciting and interactive learning atmosphere totally different from a traditional classroom situation. This atmosphere will enable children:

- to enquire, investigate and raise questions;
- to get opportunties to answer open-ended questions;
- to enhance their natural curiosities and imagination.

This would therefore, call for a classroom organisation with more moving space and with more flexible seating arrangements. No longer would children have to restrict themselves to formal seating patterns. This would give teachers freedom to change classroom seating plan as per the demand of a particular situation. Activities can be organized where whole class is in small groups devided each group is given differrent assignment.

**Group Activities**

Group activities make the teaching-learning process a great success. Learning becomes permanent, interesting and rewarding. It helps foster peer group interactions and help children to accept responsibility for their own actions. Most importantly, it enables children to develop respect for other and to accept other's points of view. This helps to develop in the child for abilities and skills that are essential components of an 'environmentally literate' individual.

What are the implications of group activities for a single teacher or two teacher schools? A sizeable proportion of primary schools in India are single/two teacher schools. If the teacher can foster self-learning and leadership qualities in the children through group activities it will help unburden his/her tasks. By careful organization he/she can entrust the older children to take care to younger children. In the context of health education, a number of projects in India have shown how older children can help the younger ones to learn and promote health information and practices.

Group activities can be thought of, as falling into two major groups - In class activities and

Outdoor activities. Let us now examine the activities under these two main headings.

**In Class Activities:**

A high pupil-teacher ratio and non-availability of resources are realities of most primary schools in India. Often a class may have as many as 60 to 80 children and almost no resources. To organize activities of any kind in such a situation is a difficult task. To solve this problem the NPE 1986 has recommended provision of minimum essential facilities to the primary schools under the scheme of 'Operation Black board.'

Even if the class is large, a teacher could plan out suitable group activities for teaching learning.

A few important points to be remembered for organizing group activity are:

- a group should not comprise more than 5-6 children.
- each member of the group should be assigned a specific role in conducting and reporting group activities - a recorder, a reporter, a group leader and so on.

The role of each member should be rotated, so that every child gets an opportunity to perform different roles and take different responsibilities.

To help the teacher to manage the classroom, each group may be given a different activity related to the study of the particular topic/theme/group of skills specific to component of environmental education.

**Out of School Activities:**

Teaching - learning activities in environmental education rely heavily on the exploration of the immediate environment of the child. Often teachers have to organise activities outside the classroom either in the school campus or outside the school. Outside school activities require greater planning than in-school activities. Tremendous amount of care should be taken to avoid any risk and danger. The teacher should therefore:

- make a preliminary visit to the place of activity and ensure for himself/herself all the aspects of the activities that will have to be planned out - based on that particular location;

- have a pre-out-door activity discussion with the students. This session would not only appraise them of what they would actually do, as part of the activity, but will also serve as a motivation to prepare them psychologically to work;

- provide a broad list of things to look for, in the environment i.e things available and develop a comprehensive plan of action to be given to the children;
- ask children to take essential materials like hand _ lens, measuring tapes, thermometers, notebooks and pens/pencils to note down their observations and measurements;
- instruct children about the DO's and Don'ts of the trip, so that all possible safety measures and probable hazards are taken care of;
- organize groups with capable leaders who can lead to groups in the activities chalked out; and
- provide constant monitoring of the activities and interact with the students, in order to provide them guidance in the right direction.

No outdoor activity should be organised as purely recreational. Even the so-called recreational actitivies like, class picnics, can be converted into informal learning situations. Post activity sessions should always end in discussions, exhibitions and planning of follow up work, leading to planning of more interesting activities for the future.

Integrating such environmental education activities with other subjects like Language, Art Education. Mathematics and Social Studies, should form the core of the planning session. Such integration would lead to a holistic view of life and will give opportunities for children to express themselves freely in different forms.

All learning does not take place inside the school walls and within the school timings. Children carry to school a lot of ideas and these ideas can be moulded, modified and reinforced by the teachers. Real life situations and problems relevant to the learner, can be integrated through in-door and outdoor activities affording great opportunities for a child to open up and blossom into a wholesome personality for this, the teachers' role as an organiser and manager is of prime importance.

A theme have been worked out here, to show how a teacher could plan out his/her activities based on the theme. The web chart would show how an integrated approach is adopted and teaching-learning activities become multi-disciplinary. It is for the teacher to choose those activities that would be possible for him/her of organise and manage comfortably. At the same time, he/she should take care to see that the environmental concerns are taken into consideration fully.

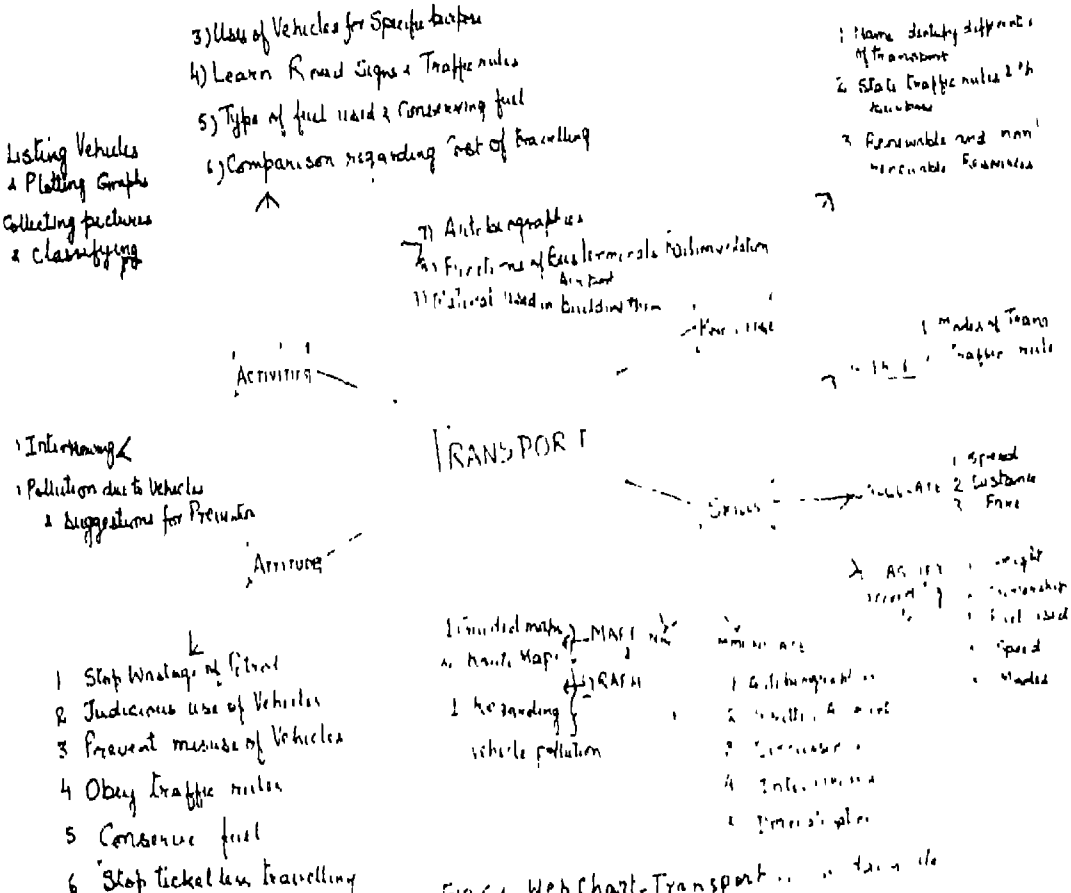



Fig 6 : Web Chart-Transport ...

The contents/concepts are drawn from the text books, developed by NCERT based on the existing curriculum at the primary level. Certain environmental orientation have been given to the topic to show how a teacher can infuse these and make teaching linked with the real-life experience of the learner. An attempt has been made to state the objectives in behavioural term. Participatory action have been listed under attitudes.

**TOPIC - Transport in our daily life**

**OBJECTIVES/LEARNING OUTCOMES**

**Knowledge and Understanding:** The pupils should be able to:

- name various types of transport available in the locality
- identify different types of transport and modes of transport used in the neighbourhood
- choose most appropriate mode of transport considering the destination of the journey and situation
- state traffic rules,describe their meaning
- fellow strictly the traffic rules and describe what heppens when these rules are neglected
- see relationship between number of vehicles on the road and pollution of air
- see relationship between types of vehicle and kind of fuel used

- collect information about vehicles which use unconventional sources of energy and compare them with the vehicle which use non-renewable source
- see relationship between distance covered and amount of petrol consumed by a car/scooter.

**Skills :**

Students should demonstrate ability to:

- observe and record a variety of transport used in neighbourhood
- classify a variety of transport based on one or more than one criteria, (e.g. light/heavy, fast/slow, number of wheels, type of energy used for running the vehicle etc.
- enumerate, record and present graphically the number of vehicles that pass a roadside in specified time and classify these
- present graphically (histogram) the most common vehicle that pollutes air
- design an imaginary vehicle which will not pollute the atmosphere
- draw and lable the parts of different types of transports available in the locality
- calculate the fares for different modes of travel and find out which is the cheapest mode but is environmentally sound.

- **design** compaign for reducing consumption of petrol/diesel.

- **prepare** maps of the immediate vicinity of the school and be able to read road maps in order to find out shortest route to a given destination from home/school.

- **express creatively** through picture, drawing, oral and/or written expression thoughts and feelings about various ways in which pollution from vehicular traffic can be prevented (For example - autobiography of a smoking car, a world without scooter - car, train, aeroplane even a bullock cart .

- **prepare** slogans/posters showing message to conserve petrol/diesel.

ATTITUDES

students should be able to take positive personal action such as:

- ways to stop wastage of petrol by identifying situations where petrol is being wasted

- use vehicles judiciously i.e.
  a) share vehicles
  b) use public transport instead of private vehicles
  c) walk or cycle short distances instead of using a car or scooter.

prevent misuse of vehicles:

a) leaving a car engine running

b) using a vehicle unnecessarily

- obey traffic and safety rules as well as ensure that others (particularly their peers) also observe these

- Collect information about conservation of fuels as well as use of alternate fuels.

- try and conserve fuel - not waste cooking gas, electricity etc. (extention)

- not travel without a ticket and try and see that his/her friends do not so.

- carry home to parents and elders these messages.

ACTIVITIES

(1) List the vehicles used by students while coming to school or going home. Plot graphs according to the number using different vehicles. Let the children have a discussion on why different children use different modes of transport. Bring-in the concepts of distance, cost and safety.

(2) Ask children to collect pictures of various means of transport. Ask the children to classify these according to:

a) Road Transport, Rail Transport, Air Transport,

- Slow/Fast ; Two wheeler/three wheeler/four

wheeler.

Let the children evolve their own criteria for classifying these.

4. Explain through drawings and pictures the various important road signs. Let the children draw these. have a discussion on why we need these signs. Lead this discussion onto an introduction to road safety rules. Let the children list these out.

   The children can be asked to match some road signs to the appropriate safety rule.

   Give the children different situations and let them
   a) draw the appropriate road signs
   b) give the appropriate safety rule.

4. Invite a traffic police person to your school. Ask him to teach the different traffic signals to the children and let them dramatise these in class.

5. List some modes of transport and what fuel they consume. Let the children match these. Have a discussion on why vehicles need fuel. Let the children classify vehicles according to those that use petrol and those that use diesel.

6. Ask the children where petrol comes from. Organise a visit to the petrol pump. Let the children collect information from the owner. In a very simple way introduce the idea that the supply of petrol is limited and that is why we must use it carefully and not waste it. Let the children classify fuels according to those that are renewable & those that are non-renewable.

7. Ask the children to find out the fare for a particular distance (say 5 KM) using different modes of transport such as scooter, taxi and bus etc. Let them infer which is the cheapest mode and why.

   Bring in the idea of short - distance travel and long - distance travel - and the time taken by different modes of travel. Let the children know that while choosing an appropriate mode they must consider cost, fuel used and time.

   Give the children matching/sorting/puzzles etc. based on the above.

8. Ask the children to write an 'autobiography of their school bus' - Let them bring in some ideas of environmental awareness, such as, the fact that many more people use a bus and so fuel is conserved, buses should not give off smoke etc.

9. Organise a visit to any of the major terminal of transport i.e. (a) Bus depot (b) Railway station (c) Airport · (if possible). Follow the guidelines for outdoor activity given earlier. Divide the children in groups. Assign following activities to the groups.

(a) Count number of buses in the depot. Classify them as stand by, in service and under repair.

(b) Collect information about the various routes to where the buses are plying.

(c) Prepare a map of the depot and showing different types of a services.

(d) List the different functions of a bus - depot.

(e) Make survey of the facilities available for the passenger and how these are· maintained. For example, drinking water facility, toilets, waiting rooms. Suggest ways to improve these facilities.

(f) List the factors that contribute to the noise pollution, environmental insanitation and air pollution in the area.

10. Let the children create imaginary vehicles and spell out what were the most important factors they kept in mind while designing the vehicle.

11. Let the children list out all the ways in which they feel the use of vehicles can be cut down. Let them draw posters or slogans.

12. Ask the children to record their observations in a heavy traffic area and also in a light traffic area. let them note - (a) the noise (b) the temperature (c) freshness of air etc. Let them compare the two & discuss.

13. Let the children collect stamps with different modes of transport.

14. Let the children interview their grand - parents to find out the means of travel when they were young as well as the layout of the city. Let them compare it to the present & make connections.

**Evaluation Item :**

1. Match the following

| | |
|---|---|
| 1) Fire | Train |
| 2) Thieves | Ambulance |
| 3) Sick man | Bus |
| 4) 1000 Passengers | Police Van |
| 5) Local School Picnic | Fire Engine |

2. Which means of transport would you choose in the following situations;

a) To go inside a narrow congested lane:

i) a bus ii) a rickshaw iii) taxi

2) To reach Bombay within a few hours

a) train b) own car c) aeroplane.

3. Names of means of transport are hidden the crossword puzzle. Try to find them

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X | B | T | R | A | I | N | Z | T |
| B | U | S | C | Y | C | L | E | R |
| O | S | P | L | A | N | R | V | U |
| A | P | C | A | R | T | Y | A | C |
| T | O | N | G | A | T | A | N | K |
| Y | T | S | C | O | O | T | E | R |

Classify them as;

i) Water Transport

ii) Road Transport

iii) Air Transport

iv) Name the fastest transport from the list.

4. Collect the following information and fill in the data:

| | Distance | Time taken | Train fare | Air fare |
|---|---|---|---|---|
| Delhi to Bombay | | | | |
| Delhi to Calcutta | | | | |

a) Which is the cheaper mode of transport?

b) Which is the faster mode of transport?

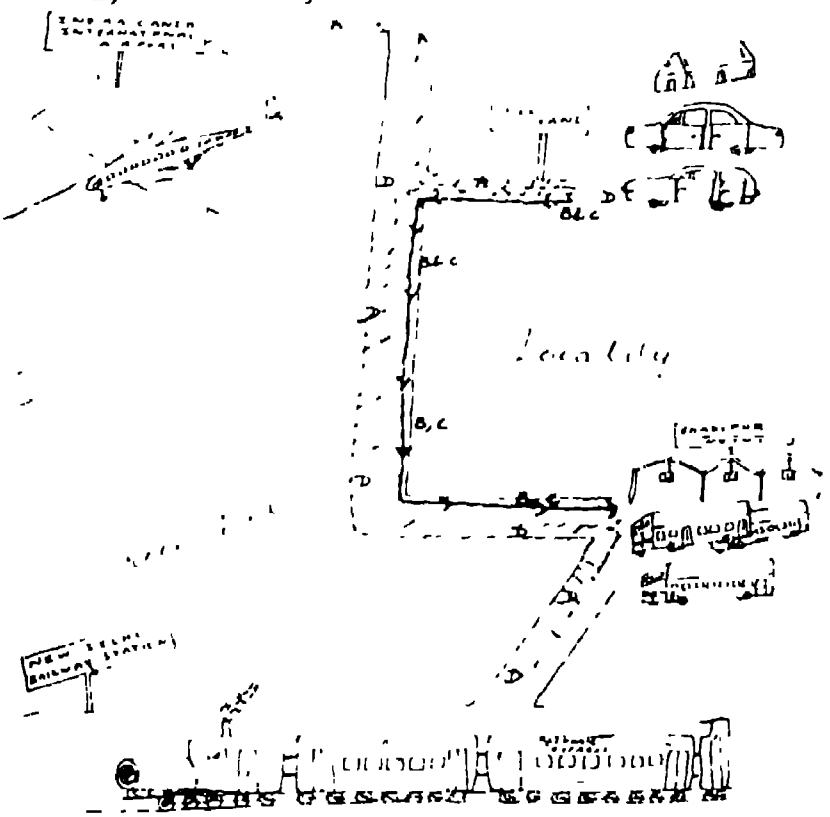
c) Draw one means of transport. Label its parts and name the material used for different parts.

d) Use waste materials such as used card board boxes, waste paper and make different means of transport.

e) Using these words write a few lines on a day without transport.

| | | |
|---|---|---|
| Stranded | Tired | No Vehicle |
| Lost | Walked | Empty Terminus |
| Miserable | Thirsty and Hungry | Lonely/Empty Roads Reached late at night. |

8) Four friends come to a taxi stand. A has to catch a flight, B has to take a bus to Chandigarh, C is going by a tourist bus and D will travel by a train.
Use different colours to trace their routes to the respective terminals. Fill in the key. Can any of them share a taxi?




Can you make a slogan on saving petrol?

9) Read the following what mistake Arun made while going to school :

One day Arun was late to school. He was in a great hurry. He chose the shortest route to reach his school. There was no footpath so he walked on the left side of the road.

He came to a crossing and ran across it hurriedly dodging between cars and buses. On the other side he ran to the school gate.

10) Choose the correct word and write below the traffic sign.

Crossroad, No parking, Railway crossing, Compulsory ahead only, Speed breaker, Right turn

11) Fill in the blanks by choosing the correct word given below:

Safety rules, Moving, Red, Signal, Zebra, Left.

a) Never board a _____ bus.

b) Always keep to your _____ _____.

c) Always use _____ crossing.

d) Where there is a traffic policeman cross only when he gives you _____.

e) Every body must obey _____.

12) Collect a railway, a bus and an aeroplane ticket. Write down important information given on each of the three tickets. How do these information help the passenger.

13) Draw the graph of the numbers and kinds of vehicles passing on Sunday (near your house) between 10 a.m. to 10.20 a.m.

14) The speed of (i) a bus is 60 Km./hr.
a train is 120 Km./hr.
an aeroplane 800 Km./hr.

Now calculate

(ii) The ratio between speed of (a) bus and train (b) train and aeroplane (c) aeroplane and bus.

15) Using the following words describe the traffic in Connaught place during rush

hours blaring, honking, tinkling, screeching, crashing, shouting, hooting whistling, hustle and bustle.

16) Use dictionary to find out the meaning of new words you don't know and classify as land/water/air transport

| | | |
|---|---|---|
| helicopter | yatch | Hydrofoil |
| Aeroplane | canoe | Cart |
| Glider | Kayak | Scooter |
| | | Motorcycle |
| | | Steam engine |

17) Visit any one of the bus depots (i) Make the rough plan of the depot.
(ii) Find 3 buses starting from that terminal and find their ending point.
(iii) Interview a bus driver or conductor.

18) Draw a map to guide a visitor on a bicycle from your school to the nearby market.

# CHAPTER - 7

# EVALUATION OF PUPIL ACHIEVEMENT IN ENVIRONMENTAL EDUCATION

## Introduction

Evaluation of any educational activity is more than an attempt to find out or test whether the children/pupils have achieved the expected or intended learning outcomes in respect of knowledge, understanding skills, and attitudes, values etc. But either longterm outcomes or short term specific outcomes should not be the only goal of evaluation. However, traditionally, evaluation has largely been, in this country associated with the idea of assessment, i.e., for passing judgement on the performance of pupils. Examination and evaluation have tended to be synonymous concepts and often teaching/learning processes have been geared to this short-sighted aim.

Evaluation in general, and evaluation of pupil achievement in particular, should be far more broad-based than what it has been. The aim of evaluation should be to carefully scrutinize the strengths and weaknesses of teaching learning process both in the school and outside and to determine whether the strategies adopted to achieve the stated goals and

objectives have really been achieved. Based on the feedback, it should be possible to redesign the teaching strategies to achieve the desirable results. Thus evaluation is essentialy an integral part of the teaching-learning process, it has to be continuous and comprehensive. Evaluation should serve three purpose:

- Give indication/feed back of pupil's progress
- Diagnose his/her learning difficulties and as well as strengths.
- Provide feed back for improving teaching strategies.

Any teaching learning process of geared to the attainment of the determined objectives. The tools and techniques of evaluation should be selected which are able to measure these objectives. The National Policy on Education - 1986 (NPE 1986) has laid stress on this aspect of evaluation. It states that the objective evaluation should be to recast the examination system, so as to ensure a method of assessment that is valid and a reliable measure of students development and a powerful instrument for improving teaching-learning"[1] The above recommendation implies that the progress and achievement of pupils should be on a continuous basis so that learning and evaluation become an integral part of each other and also

1. National Policy on Education - 1986, Chapter 4, footnote No. 4. P. 24.

inseparable from the teaching-learning process. As mentioned in Chapter 2, the policy also recommended that a Minimum Level of learning (MLL) should be identified for each stage of education. Based on this recommendation, a set of learning outcomes have been identified alongwith common core compotents and relevant content in the areas of Language, Mathematics, Environmental Studies, Work Experiences, Art Education and Health and Physical Education. The instructional materials and methods are based on these.

Inherent in the Minimum Levels of Learning (MLL), is the concept of the Minimum Level of Attainment (MLA). This implies that all children may be helped to attain the predetermined intended learning outcomes as spelt-out in the document, in terms of knowledge understanding, skills, habits/practices specified for each of the curricula areas. The internal comprehensive and continuous evaluation model presented above, further emphasise that it is necessary to evaluate growth and achievement of children through gathering evidence for judging the achievement level of each and every child.

Thus evaluation implies a process of gathering or collecting information/data on the behavioural changes that have taken place as a result of interaction. It

should be both formative and summative. The formative evaluation is a feed back mechanism which gives the teacher evidence for pupil achievement and also helps him/her to regulate /modify the teaching strategies. The summative evaluation provide sum total evidence of pupils growth and development.

Assessing pupil achievement in Environmental Education is different from other curricular areas. This is particularly true because development of specific skills attitudes, values and participatory actions are integral part of this are approach. Most of the achievement of pupils' learning are to be assessed on a longterm basis. It is not so much knowledge based, as based on changes in attitude and other behavioural patterns.

These changes in the behaviour patterns, cannot be assessed on a short-term basis. The information and knowledge-based component can be assessed by testing whether a child has acquired the relevant information after imparting to him/her the same. But development of skills of observation, classificaion, experimentation, interpretation of data etc. are not possible to be assessed through the paper-pencil test and immediately after performing a particular activity where emphasis has been laid for the development of these skills. The development of these skills are slow

and inter-related with each other. The problem of finding out suitable ways and means of evaluating these skills is an important task. Therefore, the problem of assessment of pupil achievement related to these outcomes as enumerated in the MLL is a real challenge and suitable techniques shall have to be found out for measuring these. It is necessary to ask the following questions:

- What should be the scope of evaluation?
- What should be the mode of evaluation considering the model of curriculum organization (multi-disciplinary Infusion mode) and its transaction?
- What types of tools and techniques to be use for collecting evidence of pupil learning?
- How to make use of the feed back?

What aspects of competencies skills and values are to be assessed? For objectively assessing the competencies/learning outcomes as enumerated in the 'Minimum Learning Continuum (NCERT 1981)[2] and in

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2. Minimum Learning Continuum-NCERT(1981) Contains a set of terminal competencies in area of Environmental Studies expected to be achieved by children in the end of primary stage. These competencies have been further spelt out in graded/classwise continuum for each of the curricular of the areas. This document was the basis of development of curriculum under a UNICEF-assisted-National Level Project-'Primary Education Curriculum Renewal (PECR). This document was also forerunner of the document-Minimum Level of Learning at the primary stage including syllabi and Core Components (NCERT-1991) developed in the wake. Common implementation of Plan of Action (POA) of NPE 1986. The examplar Textbooks and Teachers' guides developed for primary classes are based on this MLO and content identified the document as mentioned in Chapter 2.

'Minimum Levels of Learning', it will be essential to further elaborate and specify the exact nature of pupils' behaviour which is observable and measurable. This specificity with regard to pupil behaviour has to be worked out for each of the competencies learning outcomes for a particular class and also for individual competencies in a graded class-wise progression. The competencies enlisted in the document Minimum Learning Continuum (MLC) are arranged in a graded class-wise continuum which are vertical i.e. from one class to another as also horizontal i.e. within a particular class. The terminal learning outcomes listed in the document "Minimum Levels of Learning at the Primary Stage" have been spelt out further in behavioural terms for each unit in the Environmental Studies curriculum alongwith the common core components and contents.

A close examination of the Learning Outcomes would reveal that there is an appearant progression for a particular outcome within a unit and also among a set of outcomes classwise. There exists an inter relationship between the outcomes of the particular class as also between one class and another. The relationship is both vertical and horizontal.

This has a great significance in designing evaluation tools and techniques and also for

gathering evidence of pupils' achievements.

A conceptual curriculum model containing Expected Behavioural Outcomes (EBOs); Content (C) Learning Experiences (LEs) viz. Activities, and Evaluation, i.e. Real Learning Outcomes (RLOs) have been given in the document stated above.[3] This curriculum model can be used as a framework for designing evaluation.

It is evident from the above model that the evaluation technique must match the Expected or Intended Learning Outcomes. The Learning Experiences likewise must be geared to the development of these. Tools and techniques used for evaluation must be able to measure whether these learning outcomes have been really achieved.

## Tools and Techniques

The objectives of Environmental Education are such that it puts limitation to the use of straight goal oriented model of evaluation mentioned above. Since a large number of objectives of Environmental Education fall within the psychomotor and effective domain it is rather difficult to select tools which

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3. For details see. Minimum Levels of Learning at Primary Stages (NCERT 1991), PP, 16-18.

will measure outcomes related to these domain. Considering the limitation of teachers and high pupil - teacher ratio in the classroom it not possible to use the conventional tools. The testing situation for these outcomes have to be developed keeping reality of average primary schools.

Paper Pencil Test : Recognition and recall of facts, figures, symbols and other information can be tested through the paper pencil test. Evaluation situation would be straight recall of explanation given during teaching. Testing of understanding, concepts, generalization and principles etc. can also be assessed through paper pencil test particularly through criterion reference tests such as, multiple choice, very short answer, matching type etc.

Items banks illustrating example of criterion reference test are available. Tools and techniques of such evaluation are well known. Some samples of paper pencil tests are given in the subsequent pages.

Performance Based Tests: Development of skills, such as, observation, classification, experimentation, analysis of data, interpretation and drawing conclusion based on data etc. may not be amenable to paper pencil test and hence it is necessary to design

testing situation which calls for evidence that the pupils have acquired these skills. Performance-based test is one such technique. How to collect evidence of pupil achievement through this technique? It is desirable that the teacher prepares in advance a behaviour tally chart and notes down the behaviour to be observed. However, informal method of evaluation of pupils progress is recommended. It is not possible to involve the whole class in such a testing situtuation few children can be selected at a time. As these children engaged themselves in the activities the teacher can informally observe changes in their behaviour and make a note of the same against the particular child in a record book or dairy. Even if this method is subjective and not quantifiable it provides sufficient evidence for the teacher to modify his teaching strategy and also provide on-the-spot feed back to the pupils. Usually in a class number of learning situations are provided for developmnt of these skills. The teacher can review the progress of a particular child from one learning situation to the other. He/She can spread his/her observation over a few units and select a few children for observation at a time. In this way an informal observation will also provide him/her with feed back for finding out learning difficulties and

designing modality for remidial action.

**Assessing Attitudes :** The attitudes, concern, motivation and participatory action are important objectives of Environmental Education. The comprehensive continuous model of evaluation presented have demands that these socio-emotional outcomes should also be measured. Attitudes are formed as a result of repeated behaviour over a period of time. They form basis of habit formation which in turn, become a part of individual personality. Thus one has to watch minutely the progressive development of behaviour of students over a long time. Technique of observation is simplest and most effective for this purpose but the evidence collected need to be interpreted. An observation tool must fulfill the following criteria:

- It must define the setting;
- Define the behaviour to be observed;
- make systematic record; and
- Make objective assessment.

Some of the tools which can be used for assessing these socio-emotional outcomes are Behaviour Tally Chart, Observation Check list and Rating scale. Whether one is evaluating the process of learning or product of learning a five point

rating scale is most useful. In a rating scale the scale points can be used differently for assessing different attitudes or habit/practices. For example, for rating behaviour related to personal or community hyegine-Always (A) often (B) sometimes (C) rarely (D) and never (E) can be used. But intepretation of evidence will be to accept A, since these habits of personal should be developed in all children at the mastery level. One should always wash hands before handing food. A few sample tools have been given here as example.

Some Samples Evaluation Tools and Techniques

I. Paper pencil tests:

Unit - Man, Science and Environment

Target - Class V

A. Completion type:

Fill in the blanks with suitable words given in the bracket

a) Air we breathe out contains more _____

(Oxyzen, Carbondioxide)

b) National Park and sancturies are places where wild animals are _____

(Protected/hunted)

B. Matching type:

Match items in column A with there in column B

| A | B |
|---|---|
| (i) Trampling of plants | a. do not grow well |
| (ii) Plants kept in dark | b. rich forest wealth |
| iii) Deforestation | c. is harmful for growth |
| iv) Pollution of air | d. soil erosion |
| | e. respiratory diseases |

C. True and false

Some statements are given below. Put a tick(✓) mark on the true statement and cross (x) mark on the false statement.

a) Growing population poses no threat to the mankind

b) man has been living in harmony with nature and will continue to do so.

c) Population in India has doubled in last two decades

d) Chemical fertilizer poses a threat to the environment in long run.

e) Insecticides are a threat only to insects.

1. Which of the following animals do not belong to the group. Use their eating, habits as a basis for grouping.

i) Cat, dog, sparrow, tiger .....

ii) Butterfly, lizard, snake, frog.....

iii) Horse, monkey, tiger, elephant .....

2. Given below are names of some animals group them into following:

Animals which build nests

Animals which build burrow

Animals which live in burrow build by others

Animals which live in natural shelters

Rabbit, rat, crow, honeybee parrot, lion, snake, field mouse.

C. Multiple choice

Four alternative answers are given under each question below. Tick (✓) mark the most appropriate answer.

1. Harmony between man and nature has been disturbed because of:

a) In appropriate use of natural resources

b) Indiscriminate use of natural resources

c) Greed of man

d) Add beauty to the nature

F. Self reporting - project

Unit - Community sanitation - disposal of solid wastes

Learning outcome - Aware of environmental sanitation - take community action

Visit a nearby land-fill.

Collect following information

- What kind of waste materials are dumped there?
- is the dumping ground/land fill near the source of water?
- Are the waste materials covered with layers of earth or left uncovered.
- is it environmental and health wise sound/proper way of disposal of solid wastes?

Prepare a report of your findings suggest way to make the land-fill sanitary.

Prepare posters and slogans to make the community aware of the health hazard.

II. Obsevation Technique :

A. Behaviour Tally Chart:

Often the teacher can observe the behaviour of the children while they are engaged in

an activity and make note of their attitude towards work and towards their peer. He/she can prepare a chart of the behaviour to be observed and encouraged.

A sample of behaviour tally chart follows.

Behaviour tally chart Class

Name of the pupil

| S.No. | Behaviour | Tally Yes | Tally No |
|---|---|---|---|
| 1. | Accepts and performs assigned role in a group activity | | |
| 2. | Make careful observation of the object under study | | |
| 3. | Makes precise measurement and record of what is observed. | | |
| 4. | Follows instruction of the group leader | | |
| 5. | Cooperate with other member of the group. | | |
| 6. | Asks questions about things that he/she does not understand | | |
| 7. | makes attempts to find out answer | | |

to the queries by consulting books/asking elders

8. Reaches conclusion based on the data at hand.

---

H. Rating Scale

Unit - Food sanitation.

Learning outcomes - Practices safe handling of food items - follows rules of food sanitation

Name of the pupil .....Date.....Class.....

| S.No. | Behaviour | Rating A | B | C | D | E | N/O |
|---|---|---|---|---|---|---|---|
| 1. | Washes hands with safe water before handling food | | | | | | |
| 2. | Uses clean utencils for keeping food | | | | | | |
| 3. | Keep food items covered | | | | | | |
| 4. | Does not eat food items exposed to dust and flies | | | | | | |
| 5. | Washes hands before and after meals | | | | | | |

Rating - A. Always B-Often C-Sometimes D- Rarely E. Never

N.B. While rating the above health habits/practices teacher must ensure that every child is helped to get A, because these are very survival skills and be ensured. That each and every child develops habits of safe handling of food and water. Further, these behaviour/habit/practices cannot be observed in a particular period but in different situation during the school timings. The teacher should herself/himself motivate the children by setting examples.

APPENDIX 1

# Curriculum for Elementary Teachers Education (SIKKIM)

## 1. Content (SCIENCE)

### 1.0 Living Things

1.1 Types of living things

1.2 Types of plants on the basis of height.

1.3 Types of animals on the basis of their living place.

1.4 Needs and sources of food for us.

### 2.0 States of Matter

2.1 Three states of matter

2.2 Water cycle and wind vane

### 3.0 Force

3.1 Force, its types and units

### 4.0 Day and Night

4.1 Shape of the earth and rotation of the earth and cause of day and night.

### 5.0 Living Things

5.1 Characteristics of living things.

5.2 Functions of root, stem, leaf and seed.

6.0 Physiology

6.1 Digestion in man

6.2 Function of heart

6.3 Respiration and functions of lungs

6.4 Skeletons - system and its functions

6.5 Excretory system in man

7.0 Soil Erosion, its agencies and Prevention measures

8.0 Seasons, their causes and effect on us

9.0 Classification of Living thing

9.1 Classification of plants

9.2 Classification of animals

10.0 Disease

10.1 Deficiency diseases their symptans and preventive measures

10.2 Transmission of various diseases and their preventive measures

10.3 Useful and harmful microbes

11.0 Coal and Fertilizer

11.1 Coal and its types

11.2 Petroleum and its products

11.3 Manure, fertilizer and crop rotation

**12.0 Atmosphere**

12.1 Atmospheric pressure and its uses

12.2 Consituents of air

12.3 Air pollution - its cause and effect and its preventive measures

12.4 Water pollution - its cause and effect and its preventive measures

**13.0 Definition of Volume mass and density and relationship among three**

**14.0 Moon - a Satellite its structure and environment**

**15.0 Shadow and Eclipse**

15.1 Shadow its type

15.2 Solar eclipse

15.3 Lunar eclipse

15.4 the solar family

**16.0 Motion and Energy**

16.1 Laws of motion

16.2 Work, Power and Energy

17.0 Measurement of thickness of a plate by Screw guage

18.1 Measurement of curvature of a curved surface

19.1 Measurement of length of a piece of a rod.

20.1 Determine the value of 'g'

21.1 Determination of specific gravity or sand with help of sp. gr. bottle

22.1 Reflection of light

23.1 Refraction of light

24.1 Determination of magnetic lines of force

25.1 Ohm's law and its verification

26.1 Structure and study of typical animals cells and its verification

27.1 Use of a microscope

28.0 Anatomy of plants

28.1 Internal studies of a dicot root.

28.2 Internal studies of a monocot root

28.3 Internal studies of a dicot stem

28.4 Internal studies of a monocot stem

28.5 Internal studies of a leaf.

29.0 Study of animal life

29.1 External study of earthworm/leech

29.2 Dissection of alimentary canal of a frog

29.3 Nervous system of an earthworm

29.4 Alimentary canal of an earthworm.

30.0 Physiology of Plants

31.1 Elements, Compound and mixture

32.1 Physical change and chemical change

33.1 Atomic structure

34.1 Fertilisers and their use in the field of agriculture

35.1 Acid and Base & their test.

36.0 Preparation and properties of gases

36.1 Oxygen

36.2 Hydrogen

36.3 Carbondioxide.

Social Studies

Content

1.1 Festival in the family

1.2 Domestic animals and wild animals

1.3 Early man

1.4 Some greatmen of the world

a) Religious

b) Great Thinkers

c) Sea Explorers

1.5 Places of Historical Interest of India.

1.6 India's struggle for freedom

2.1 Learning and playing together

2.2 Change in behaviour

a) Good habits

b) Good manners

2.3 Places of worship

2.4 Home and School

2.5 The Post Office and other services

2.6 Modern means of communications

2.7 Our state and Govt.

2.8 Our neighbouring countries

2.9 U.N.O.

2.10 Population Education

3.1 Man's Basic needs shelter

3.2 Place and Time

3.3 The Nothern fertile plain

3.4 Our developing villages

3.5 Life in some parts of the world

a) The land of sun rising

b) The grassland of Argentina

3.7 Two great Industrial Countries

a) U.S.S.R.

b) U.S.A.

3.8 The Planet EARTH

Land

Water

Air

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